THE RUBBER AGE

ESTABLISHED 1917

COVERS ALL PHASES OF THE PRODUCTION AND MARKETING OF CRUDE RUBBER AND THE MANUFACTURE AND DISTRIBUTION OF RUBBER GOODS

Vol. 34 FEBRUARY, 1934 No. 5

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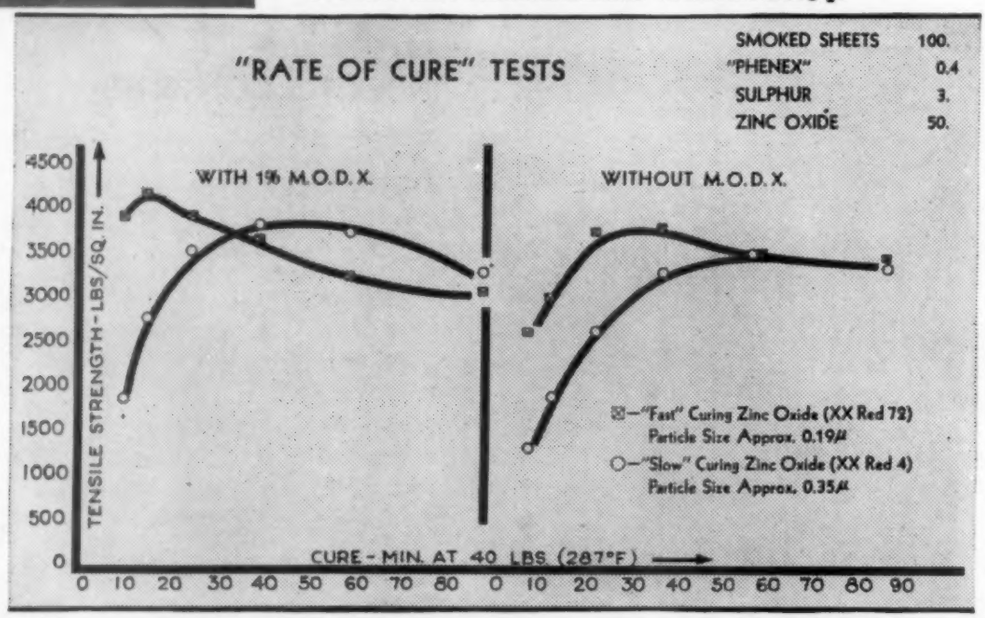
No. 23

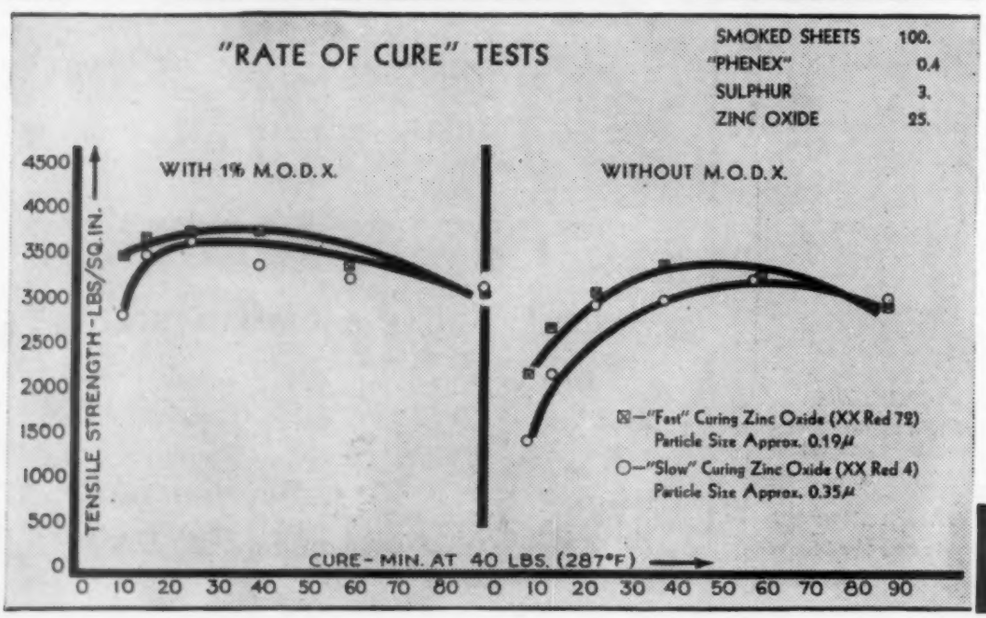
of a series of charts showing a comparison of "fast" and "slow" curing zinc oxides with typical accelerators.

EFFECT OF CONCENTRATION OF ZINC OXIDE ON RATE OF CURE

The differences between XX Red 4 "slow" curing and XX Red 72 "fast" curing are quite marked in a compound containing 100 parts of Zinc Oxide, and these differences are increased by the addition of M. O. D. X. As the concentration of Zinc Oxide is reduced to 50 parts and 25 parts, the differences between the two types of oxide practically disappear. With 50 parts of XX Red 72 with M. O. D. X. there are indications that the compound is over accelerated.

This chart and twenty-two others appear in the booklet, "Zinc Oxide in Rubber". Send for a copy.





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Increased Applications of RUBBER in 1934 Automobiles

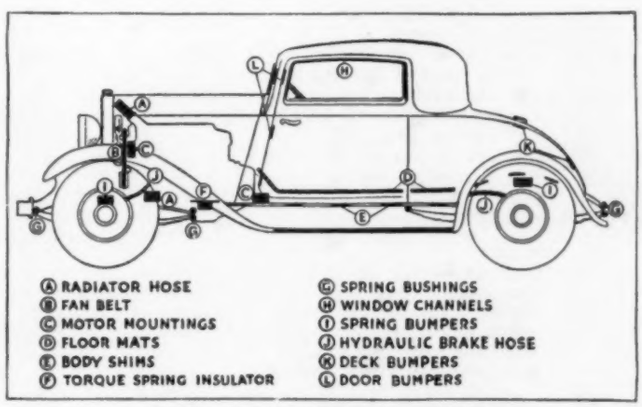
Its Properties Now Give It a Vital Part as a Constructional Material in Motor Car Design

DEVELOPMENT of the modern automobile has, of course, been possible only through the concurrent development of the rubber tire. In recent years, however, the use of rubber in car construction has been extended far beyond its primary employment in tires and tubes. Rubber today has a definite place as an important constructional material in scores of applications throughout the body, power plant, transmission, suspension system and braking mechanism of the motor vehicle of 1934.

This year's models of motor cars are lavish users of rubber. It is estimated that the average medium-sized automobile employs rubber to a total weight of about 150 pounds, whereas five or six years ago the corresponding figure was in the neighborhood of 100 pounds. Tires and tubes account for 70 per cent of the present day total figure.

To put it another way, the average car in 1925 used about three pounds of rubber parts in addition to the rubber in tires and tubes, while 1934 models carry from 30 to 60 pounds of rubber parts. Each modern car, in fact, uses the entire yearly output of from 30 to 40 rubber trees.

One manufacturer, the Chrysler Corporation, uses over 450 different rubber parts in its line, covered by 50 individual rubber specifications. In a single model, the Chrysler 8-sedan, there are 270 different rubber parts, representing 3.8 per cent of the total weight of the car and approximately 8 per cent of its total cost.

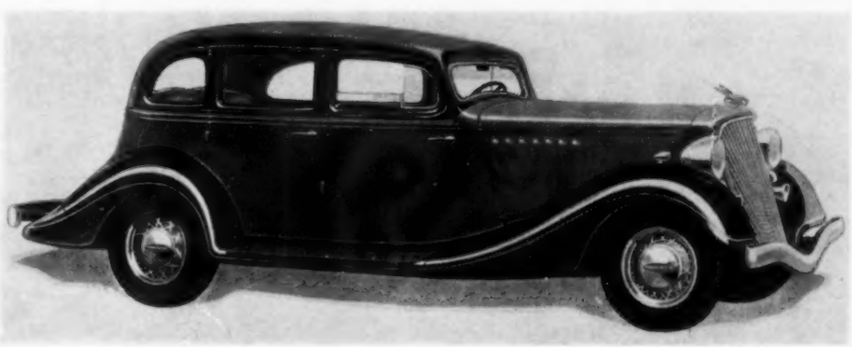


Rubber in the Motor Car of 1934

A few of the numerous places where rubber is employed in today's car models are indicated by Goodyear Tire & Rubber Company engineers by the blacked-in spots.

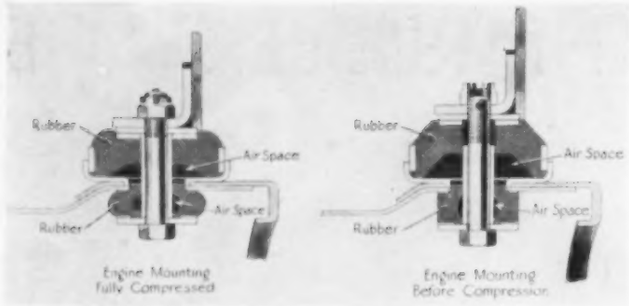
The Engine Assembly

The most popularized use of rubber in recent years has been in the field of engine mountings. Since



A Typical Modern Automobile

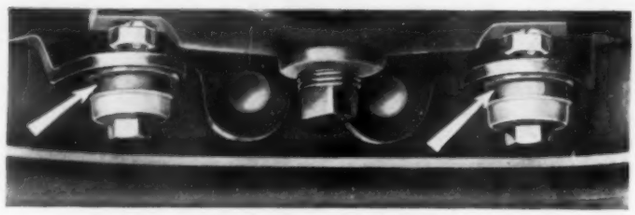
. . . The 1934 Essex Terraplane in which rubber is used from the engine mountings to the backing for the mohair upholstery fabric.



Engines Now Rest on Rubber Cushions
. . . The rubber mountings that support the power plant of the 1934 Hudson and Essex Terraplane cars

Chrysler introduced a flexible type of mounting with torque cushioning for the 1931 Plymouth under the title of "floating power," some method of rubber mounting for the power plant has been adopted by practically every American manufacturer. No longer is the engine rigidly attached to the chassis.

The Willys, among others, employs the "floating power" patents for its engine mountings. Auburn has a system of air cushioned rubber mounting that positively eliminates any vibrations from the engine being transmitted to the chassis frame and literally cradles the engine in air and rubber. The Nash motor is cushioned in rubber at five points, using a "biscuit" type of mounting such as is also employed by the Ford company.



Rubber in the Transmission Stabilizer
. . . A "worm's eye view" of the Oldsmobile rubber-cored transmission hold down bolts, the rubber sections being indicated by arrows

Oldsmobile has a semi-pneumatic front engine mounting that cushions any engine movement and a rear engine

Applications of Rubber in a Modern American Automobile

Typical of the advanced automobile of 1934 is this list of rubber parts employed by the Cadillac Motor Car Company in the construction of the new models of Cadillac and La Salle motor cars:

Engine

Crankshaft balancer
Pipe insulators
Gasoline & vacuum pump diaphragms & gaskets
Engine wiring and insulators
Distributor high tension wire nipples
Engine supports (5 points)
Accelerator pedal stop
Carburetor intake air hoses
Air cleaner gaskets

Cooling System

Hoses
Gaskets
Fan Belt
Radiator thermostat seal
Radiator thermostat cover
Radiator overflow hose
Radiator mounting cushions

Clutch and Transmission

Pedal cover
Gear shift lever knob
Pedal stop
Compounded in clutch facing

Axles, Wheels and Spring Suspension Parts

Tires & Tubes & protecting strips
Spring bumpers (4 front, two rear)
Stabilizer cross shaft bushings
Grommets for manual shock absorber control rods
Wire wheel disc cushion
Wire wheel disc gasket
Wheel disc valve grommet
Rear spring friction strips
Valve stem grommet
Spare tire mounting clamp insulators
Tire carrier grommets
Tire cover bumpers

Steering System

Steering wheel rim
Steering column support pad
Steering column grommet

Brake System

Pedal cover
Cable grommets
Vacuum cylinder boots, seals and hoses
Brake operating lever boots
Brake cable boots
Vacuum brake operating rod covers
Pedal stop
Compounded in brake lining
Lever stop bumpers

Exhaust System

Muffler & tail pipe mounting bracket grommets
Muffler supports

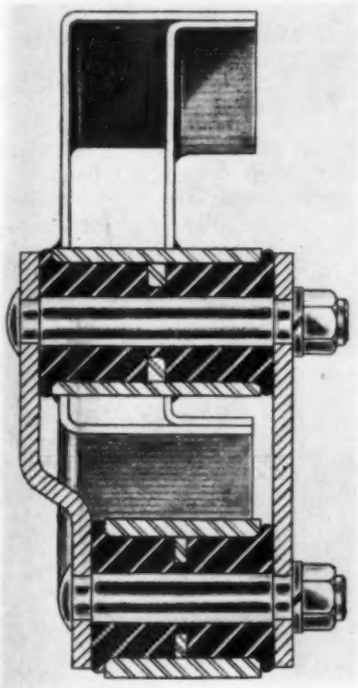
Electrical and Lighting Systems

Battery and Leads
Battery box fillers
Wires
Insulators
Grommets
Horn projector grommet
Horn mounting bracket insulator
Lamp bracket pads
Ignition lock cable retainer

Body and Sheet Metal

Pads between body & frame brackets
Dash grommets
Clutch & brake pedal seals
Hood corner protectors
Hood side panel ventilator bumpers
Cowl ventilator bumpers
Fisher C.V. ventilator seals
Gasoline tank filler tube grommets
Miscellaneous sponge rubber fillers & grommets
Sponge rubber foot rest and hassock padding
Sponge rubber arm rest padding
Bumper grommets
Floor board insulators
Windshield wiper hose, gaskets, & blades
Folding Trunk rack grommet
Running board stone deflectors

mounting with a live rubber section encased in steel. Engineers of the Continental Motors Corporation have developed the "winged power" mounting which consists of two rubber spools at the front and one rubber block vulcanized to copper at the rear. The motor, clutch and transmission are so mounted on these supports that the torque reaction is entirely absorbed through the rubber instead of being transmitted to the frame or body. This system is used in Continental cars and in Continental engines supplied to other builders.



Spring Shackles

. . . on Auburn cars are provided with live rubber bushings

Other places in the engine assembly in which rubber is to be found are the crankshaft balancer, pipe insulators, distributor high tension wire nipples, accelerator pedal stop, carburetor intake air hoses, crankshaft vibration damper, air cleaner gaskets, and gasoline and vacuum pump diaphragms and gaskets.

The Body Construction

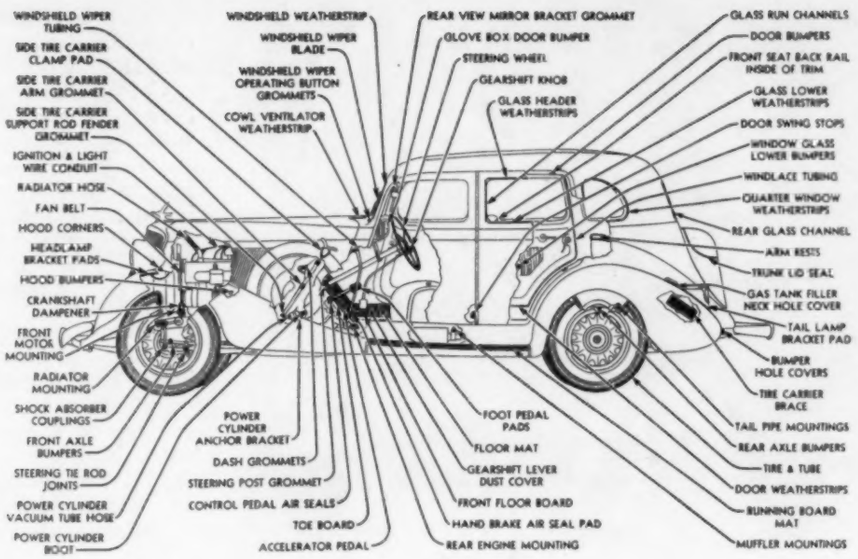
Applications of rubber are scattered generously through the coachwork of the modern car. Many manufacturers find that bodies mounted on rubber pads are more satisfactory than those similarly mounted on felt. Rubber mats are employed inside the car and on the running board, while even the windshield wiper hose, gaskets and blades are of rubber. Rubberized fabric is used for roof covering.

"Rubber is used extensively in the body construction," according to Continental Automobile engineers. "We not only use it for grommets at various points but find that it is necessary to use this material for weather-proofing and noise-deadening.

"The windshield is set in a rubber frame. Windlacing tubing made of rubber is placed around all doors. Weatherstrips for both top and bottom of doors are likewise made of rubber. A soft sponge rubber is used to make the cowl ventilator leak-proof.

"The body bolts are spaced with rubber. This permits bolts to be drawn in place but does not permit the body to come in contact with the frame at any point. Rubber spacers are used between the frame and the body.

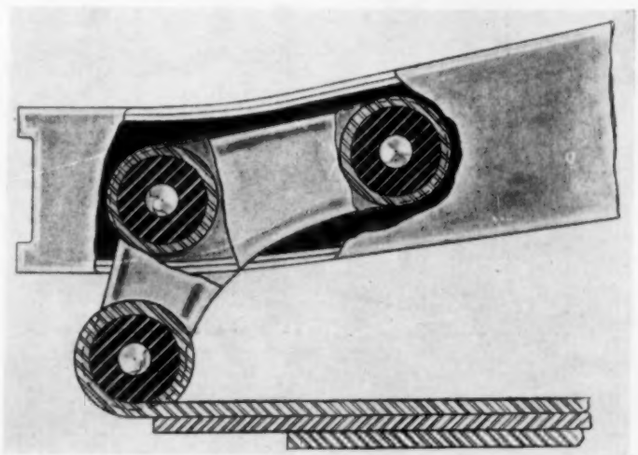
"All window channels have a rubber base. This serves two purposes: it not only keeps out the weather but serves as a bumper for the glass. A rubber roller bumper is used at the bottom of each opening. Rubber is used elsewhere on the body in the cowl ventilator drain tube, door bumpers, door check stops, door check bumpers, rubber dough silencer, window regulator handle inserts, door header weatherstrips, wiring insulation, wiring insulating sleeve, rubber mat, rubber cement, door glass bottom channel weatherstrips, and front door glass bumper inside."



Rubber Parts in the 1934 Studebaker

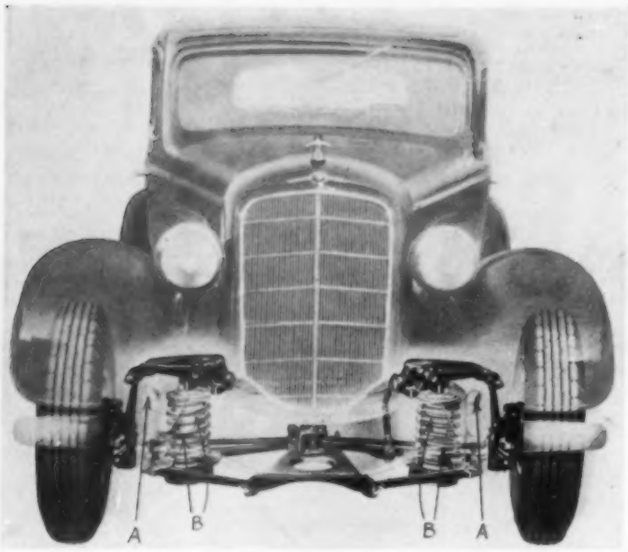
. . . This car employs rubber at more than 60 different places, as shown in the detailed drawing reproduced above

What may be the most important interior use of rubber, however, is in connection with the actual upholstery and fittings. Sponge rubber backed carpet is already used in certain Ford models and other cars, while Cadillac and Lincoln employ sponge rubber for arm rest foundations. Packard announces that it is using sponge rubber in upholstery, but the greatest progress in this use thus far has been made in England where various types of rubber constructional material for seating have been experimented with. (Vide "Developments in Use of Rubber for Automobile Cushions," THE RUBBER AGE, November, 1933.)



Rubber in Kick-Shackle Construction

Three live rubber bushings are included in the new Auburn kick-shackle and act as cushions, movements being absorbed through them rather than through the springs



Rubber in "Knee-Action" Wheels

Points at which rubber is used in the Oldsmobile front end suspension include (A) the rubber bumpers on the frame against which the shock absorbers strike and (B) the upper and lower bumpers in the coil springs for the same purpose

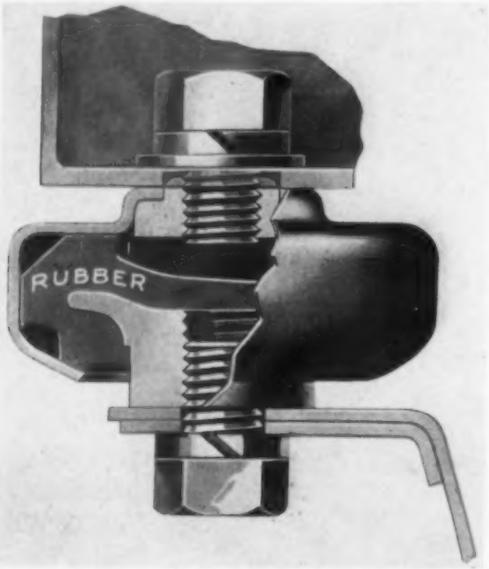
The chief basic types are the pneumatic cushion, sponge rubber, and the latex-coated hair filling. General use of rubber for seating would add at least 15 pounds of rubber to that now employed in every car.

Cooling System

Most familiar uses of rubber in the cooling system are, of course, the fan belt and radiator hose. The V-type fan belt has become most popular, although the flat type is still used in some models. Rubber or rubber-and-canvas hose is employed between the radiator and the engine and also for connecting the water pump.

Other applications of rubber in the cooling system include various gaskets, the radiator cap, radiator shims, radiator thermostat seal, radiator thermostat cover, radiator overflow hose and rubber mounting block or cushion. Rubber mounting for the radiator absorbs vibration and prevents radiator core breakage.

Continental employs a special rubber hose as a coupling between the water pump and the generator so that the water pump may be driven through the generator drive shaft. This makes a coupling which is free from noise and seldom requires replacing. Prior to the use of rubber, metal couplings were used which became very noisy and in time required replacing.



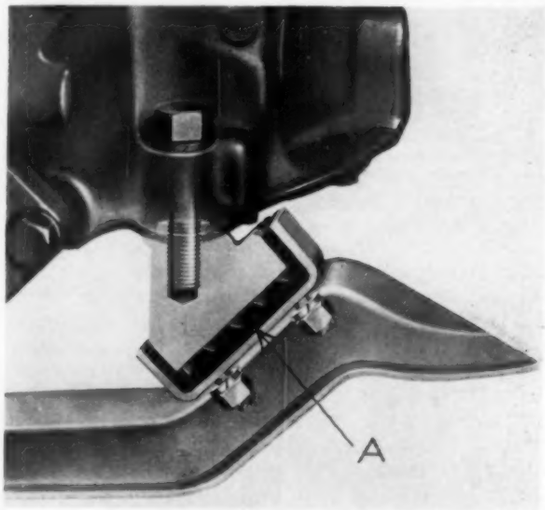
Oldsmobile Front Engine Mounting

. . . The rubber section acts effectively to cushion any engine movement

Clutch and Transmission System

Automotive engineers find rubber an effective cushioning material in the transmission system, particularly on heavy trucks, and it is general practice to fit two flexible couplings of rubberized fabric in disc form between the engine and the gearbox to allow for misalignment and to soften torque impulses. Borg & Beck use a molded rubber center for their clutches, retained in an aluminum die casting, which enables the drive to be conveyed without metal-to-metal contact and absorbs vibration.

Rubber is used for the clutch pedal cover, the gear shift lever knob, and the pedal stop. Metallic couplings which require lubrication are protected from dirt by fitting rubber



Oldsmobile Rear Engine Mounting

. . . The rubber section (A) is encased in steel in this particular mounting

grease retainers of a special composition that resists the action of grease.

Suspension System

Aside from tire casings, tubes and protecting strips, rubber has been given increasing attention in its application to axles, wheels and spring suspension parts. It is important in the individual front wheel spring suspension, which has been so greatly popularized in this year's models. In the Oldsmobile "knee action" wheels, to mention a typical example, there are rubber bumpers on the frame against which the shock absorbers strike, and upper and lower bumpers are used in the coil springs for the same purpose.

Rubber is widely used for spring shackles, where it obviates the necessity of lubrication and eliminates noise. It is an important component in all shock absorber or stabilator construction. Attempts have been made to perfect an all-rubber suspension system, eliminating the steel leaf-spring, but have not thus far proved acceptable.

(Continued on page 223)

New Rubber Mill Rolls For Heavier Duty

Rolls of High Carbon Steel Give Results Well Above the Usual Cast Iron Types

By FRED C. T. DANIELS

Research and Development Engineer, Mackintosh-Hemphill Co.

WHEN a few years ago engineers of the large Akron rubber companies attempted to mix a much stiffer and tougher rubber stock than had been used before, they found that the way of the pioneer, like the way of the transgressor, was hard. The chilled iron rolls, which ever since the start of the rubber industry have been standard for breaking up the crude rubber, and compounding it with various reagents for sizing, vulcanizing, coloring, and so on, could not stand the gaff. Under the immensely increased strains and stresses, breakage increased to an alarming degree. This breakage was not due to any inherent defects in the chilled iron roll. It was merely the logical result of working a material far beyond the limits of its physical properties.

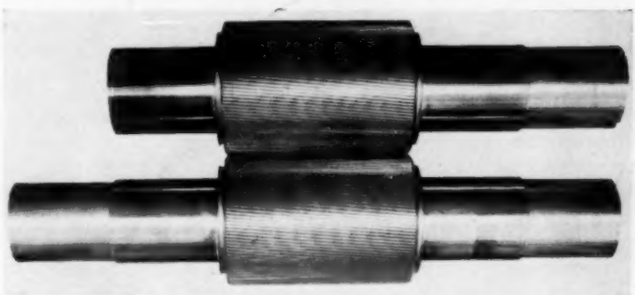
Chilled iron rolls are made by casting a carefully controlled mixture of molten cast iron into a mold. The mold for the roll body consists of a heavy walled cast iron cylinder. This naturally conducts away the heat from the molten metal in contact with it very rapidly, and so acts as a "chiller." The extremely rapid chilling action causes the surface iron to harden, without giving the graphite in it a chance to come out of solution. The consequent high combined carbon content of this surface iron makes the surface hard. The inner portion of the body of the roll cools more slowly, and the graphite in solution in the molten metal forms in flakes. This form of cast iron is stronger than the high combined carbon hardened type.

As a result of this method of casting, the finished roll has a hardened surface, from one-half inch to one inch deep, which resists wear. The remainder of the roll is made up of the softer, stronger cast iron to give strength. In casting the rolls, a sand mold is used for the journals. This allows the journals to cool more slowly, and to form a fairly soft cast iron, which will have a maximum possible strength.

As the surface becomes worn in use, the rolls are reground. When sufficient regrindings have been made to remove the true chilled surface, the roll is unfit for further use.

Regardless of the care with which the rolls are made, they still remain cast iron—subject to its very definite limitations as to shock resistance, resistance to expansion and contraction due to heat and cold, and strength under stress. The physical properties of cast iron are definite. No treatment will expand them.

Early in 1929, the Mackintosh-Hemphill Company was called in on the problem. This company had been a manufacturer of rolls for over one hundred years, and so was familiar with the problems which had to be met. The job of producing a pair of rolls which would withstand the greatly increased stress introduced by the new process, and still have the requisite durable and smooth surface, was turned over to it.



Heavy duty rubber mill corrugated rolls made of an enriched alloy high carbon cast steel

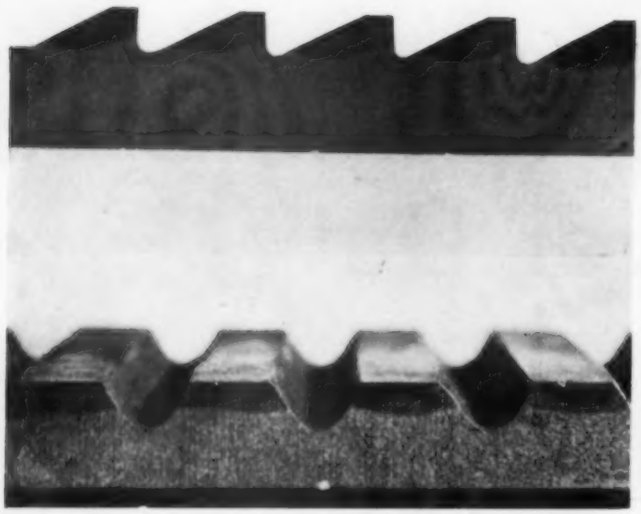
The first experiments involved the addition of toughening alloys—nickel, chrome and molybdenum—to the existing cast iron roll mixture. The use of small quantities of these alloys somewhat increases the strength of the rolls. The use of larger quantities increases the surface hardness —which is usually from 60 to 72 scleroscope, depending upon the service they are required to meet—as high as 90. The strength was somewhat improved, but breakage continued. The rolls were still cast iron, and subject to all its inherent weaknesses. Obviously, the solution to the problem did not lie along this pathway.

As a second step, the experimenters forsook cast iron entirely, and cast two pairs of rolls—one 60-inch and one 84-inch—of a special enriched alloy high carbon cast steel —generally known as MacHempIte. The bodies of these rolls were heat treated to from 55 to 60 scleroscope hardness.

These rolls were installed, and exhaustive tests run on them. They have been in continuous use to date, without even being taken out of the mill for regrinding.

It was found that the surface of the body of the new rolls took a smooth bright finish, comparable to that of chilled iron. The journals were smooth, and presented a good bearing surface. Because of the superior physical properties of the steel, the walls of the bodies and journals could be made thinner, while still giving the required excess of strength. This resulted in a saving of about 1,200 pounds in the weight of an 84-inch roll over that of the heavier walled—but still weaker—cast iron roll.

MacHempIte possesses a greater coefficient of thermal



Sections showing two types of teeth used on corrugated rolls. The Wearproofing process, shown by the darker zones, is confined to the areas requiring it; the remaining metal is unchanged and retains its primitive characteristics

conductivity than the cast iron, and, in addition, has a decreased wall thickness. This naturally greatly increased the efficiency of the cooling water, permitting the mill to carry a greater load without any danger of overheating the rubber stock. The improved thermal properties also eliminated the breakage due to rapid expansion and contraction, to which cast iron rolls were subject.

The tests revealed that, in service, the fixed knives, or those held in contact with the roll mechanically, had no effect on the roll at all.

The hand knife made a microscopic scratch upon the highly polished surface, and after a time a multitude of these scratches produced a dull silky appearance. This in no way detracted from the utility of the roll. In fact it gave the roll a better bite, drawing the stock through the rolls faster and kneading it better.

The automatic knife—that is, one which intermittently comes down firmly against the surface—occasionally produced scoring. When automatic knives were used, therefore, the chilled iron roll was retained for the front, or knife contacting roll. The steel roll was used for the rear. This composite arrangement gave satisfactory service, as over three-fourths of the breakage occurring when both rolls were cast iron had occurred on the rear roll. Thus, by the use of MacHempIte rear, or driver rolls, breakage was reduced 75 per cent.

After the completion of the preliminary tests, extensive service tests have been continuously conducted by the original user, and by several other large companies. A very stiff rubber stock is rolled, on a high production schedule. The results indicate that these steel rolls are unbreakable under any conditions—either mechanical or thermal—encountered in the processing of rubber. During one experiment one of these companies claims to have expended about two thousand dollars in testing the truth of the contention that the rolls were unbreakable and absolutely foolproof, so far as any of the irregularities experienced in the mixing and compounding of rubber were concerned. The rolls did not break.

After the check of MacHempIte for smooth rolls had been carried far enough to indicate that it would be satisfactory, corrugated rolls for cracker, washer and grinder rolls were developed, and similar experimental and service tests conducted.

The rolls formerly used were chilled or sand cast iron, with the corrugations machined into the hard surfaces of the bodies. These corrugations or teeth were hard, but naturally of a brittle nature, and rapidly broke or chipped off in use. Under severe service conditions, the rolls themselves broke through the bodies or journals.

Preparation of Corrugated Rolls

The MacHempIte corrugated rolls were manufactured in a somewhat different manner than were the smooth rolls. After casting and cleaning, they were heat-treated to their softest and strongest condition, and then completely machined—including the cutting of the corrugations. The teeth or corrugations were then subjected to the Mackintosh-Hemphill "Wearprooft" process. This permits the hardening of the surface of the teeth to a 70 to 80 scleroscope, extending to a depth of 3/16 to 1/4 inch. The location, depth, and degree of hardness can be accurately controlled by this Wearprooft process. As a consequence, the hardening of the surface does not affect in any way the primitive strength and other characteristics of the backbone of the corrugations, nor of the roll itself. The attached photographs show a complete machined corrugated roll, and sections from two of the types of corrugations which have been subjected to the Wearprooft process.

The experimental and service tests run on these corrugated rolls showed them to have wear and service properties equal to those of the smooth MacHempIte rolls. The rolls do not break nor do the teeth chip off or break. The corrugations, being harder and tougher, produced correspondingly longer life. It was found that when the corrugations were ultimately worn down, the rolls could be remachined and rehardened. This process can be repeated until the diameter of the roll body is reduced to a point where the journals contact each other.

A sleeve only, of MacHempIte, can be furnished, and pressed on to an existing shaft. But because of the initial long life of the unit roll, and the possibility of at least three tooth renewals, the unit roll is much more economical in the long run.

The greater unit strength of this alloy steel permitted a much thinner wall on the bodies and journals of the corrugated rolls than were necessary when the material was cast iron. They showed the same mechanical and thermal advantages as were possessed by the thin walled, smooth roll of the same material. There was, of course, a decrease in weight.

Since several years of service tests have now been completed, certain conclusions may safely be drawn concerning the new type of roll.

MacHempIte smooth rolls for sheeter, warmer and mixer rolls, and the MacHempIte Wearprooft corrugated rolls for cracker and washer rolls, apparently meet the requirements for added strength and wear which have been imposed by more severe service. Mills are rolling a stiffer rubber stock, in order to produce rubber articles with superior wear and service qualities. These rolls will stand the added stresses and strains which come from the working of this stiffer material.

New Rolls Increase Production

Rolls of this type will apparently produce an increase in production. Part of this is due to the fact that the operator need not "hold back," but can run the mill to its full capacity without fear of penalties because of roll breakage. The speed of operation is only limited by the heat generated in the stock itself—and this can be held to a minimum because of the more efficient cooling possible.

The MacHempIte smooth rolls show a higher initial cost than cast iron rolls—a natural result of its enriched content

(Continued on page 222)

Rubber Industry in Japan Making Rapid Progress

Island Empire Has Now Become a Leading Exporter of Tires, Footwear and Toys

A REVIEW of the rubber industry in Japan by J. P. Manton, Assistant Canadian Trade Commissioner, appeared in a recent issue of Canadian Commercial Intelligence Journal. The complete report follows:

The Japanese rubber industry probably had its beginning in 1883, when a small rubber factory was established in Tokyo. In its early days, progress was slow. Ebonite was first made in 1892, rubber balls in 1897, bicycle tires in 1902, and rubber shoes in 1910. The progress achieved in the last decade has been extraordinary, and today the industry satisfies the home demand practically in all sorts of rubber goods, and, moreover, exports a fairly large volume of rubber products to all regions of the world.

At the end of 1931, the last year for which official figures are available, the number of manufacturing companies was 238, with a total authorized and paid-up capital of 38,000,000 yen and 26,000,000 yen respectively. In all, there were 593 rubber works, 469 of which, or nearly 80 per cent of the total, were small-scale enterprises employing less than 100 employees. Two establishments have over 1,000 employees each.

Production

The annual production value of rubber goods in recent years was in the neighborhood of 70,000,000 yen, the most important products being tires, footwear, hose, belting, and toys. In 1931 the total production figure was 59,700,000 yen, of which tires and tire accessories accounted for 19,500,000 yen or about one-third of the total, followed by footwear with a value of 15,900,000 yen or 27 per cent. Though last year's production figures are not yet available, it is expected that the returns were much higher than in the previous year, as both the import of raw rubber and the export of rubber goods in 1932 were much larger than in 1931.

Rubber Goods Production in Japan in 1931

	1,000 Yen
Soft rubber goods—	
Tires and accessories	19,454
Tires for aeroplanes, automobiles and motorcycles	6,926
Tubes for aeroplanes, automobiles and motorcycles	783
Tires for rickshaw and bicycles	9,430
Tubes for rickshaw and bicycles	1,576
Miscellaneous	740
Mechanical rubber goods	636
Footwear	15,930
Toys	3,320
Hose	5,304
Belting	4,005
Miscellaneous	9,899
	58,549
Hard rubber goods—	
Electrolytic cells	264
Miscellaneous	849
Total	1,113
Grand total	59,662

Exports

Today Japan is not only able to satisfy the home demand, but also exports annually a fairly large volume of rubber products. In 1932, the export of rubber goods was valued at 16,300,000 yen, the figures in 1931 and 1930 being 11,500,000 yen and 13,200,000 yen respectively. More recently exports have been highly encouraging, due mainly to the depreciation of Japanese currency. The export figure in the first half of this year attained the high level of 14,500,00 yen or 2.7 times and 2.4 times as high as the figures reached in the corresponding periods of 1932 and 1931. The main items of rubber goods for export are tires, boots and shoes, and toys. The export of tires last year reached 4,100,000 yen, boots and shoes 4,600,000 yen, and rubber toys 4,400,000 yen. The most important buyers of Japanese rubber products are Great Britain, the United States, British India, China, Dutch East India, and Kwantung Province.

Exports of Rubber Goods from Japan in 1932

Figures in 1,000 Yen

	Shoes and Boots	Tires	Toys	Others	Total
Great Britain	2,284	1	887	8	3,180
United States	209	1	2,087	27	2,324
British India	604	596	643	368	2,211
China	143	1,359	83	355	1,940
Dutch East Indies	276	1,223	278	111	1,888
Kwantung Province	216	435	47	332	1,030
Total	4,890	4,378	5,507	1,479	16,254

Imports

The increase of exports in recent years has been accompanied by a sharp decline in imports. In 1930 the total value of imported rubber goods amounted to 4,800,000 yen, decreasing to 3,200,000 yen in 1931 and to 1,500,000 yen in 1932. Recently, this tendency has become more marked. The total value of imported rubber goods in the first half of this year reached only 479,000 yen, which is about half that of the corresponding period of last year, or about one-third of that of 1931. Among imported goods, automobile tires have been most important, but due to the development of the home industry, there has been a great decline in the trade, whilst the import of other rubber goods such as unvulcanized articles and soft rubber products has shown little change. The most important suppliers of automobile tires were the United States and Great Britain.

Imports of Rubber Goods into Japan in 1932

Figures in 1,000 Yen

	Tires for Autos	Unvulcanized Goods	Soft Rubber Goods	Others	Total
United States	267	298	516	24	1,105
Great Britain	112	41	130	..	283
France	23	..	12	..	35
Germany	..	..	19	1	20
Canada	19	..	..	..	19
Total	423	340	680	25	1,470

Raw Rubber Importations

The volume of raw rubber imports may be regarded as a barometer of the progress of the industry. It reached 57,000 metric tons in 1932, compared with 44,000 metric

tons in 1931 and 33,000 metric tons in 1930. The main suppliers were the Straits Settlements and Dutch East India. Out of the total imported in 1932, 36,000 metric tons, or 64 per cent came from the Straits Settlements and 18,000 metric tons or 32 per cent from Dutch East India.

Bureau of Standards Activities

WHILE the activities of the Bureau of Standards have been somewhat curtailed owing to reduced appropriations, work on several projects relating to rubber and rubber products has been continued during the past year. Progress on certain of these studies is noted in the following abstracts from the annual report of the Bureau:

Insulating properties of rubber.—A complete study of the dielectric constant, power factor, and resistivity of rubber sulphur compounds at temperatures from —75° to +150° C., and under various pressures, has been completed.

Thermodynamics of rubber.—The heat capacity-temperature relation of rubber has been found to follow a smooth curve from 14° to 195° K., but shows an anomaly between 195° and 202° K. which is probably associated with the hardening of rubber on cooling. The heat of combustion of rubber hydrocarbon in the "sol" modification was found to be 45,231 ± 14 joules per gram at 25° C.

Photo-elastic properties of rubber.—The double refraction of rubber under stress has been studied in relation to composition. The stress-optical properties of rubber, vulcanized with sulphur alone, differ markedly from those of rubber vulcanized with sulphur and organic accelerators. Photo-elastic methods have been applied to the study of stress distribution around inclusions in transparent rubber sheets under tension, and have yielded results in agreement with theory. A new type of gage was developed in order to make dimensional measurements with an accuracy comparable to that of the optical observations.

Accelerated aging test for waterproofed fabrics.—An accelerated aging test, designed to produce changes in the waterproofness of cloth similar to those which may occur in service, has been developed. The results obtained are comparable to those on fabrics exposed out of doors.

Testing of Automotive Rubber Goods

IN the division of the United States Rubber Company's Detroit plant that is devoted to the manufacture of automobile material other than casings for tires, the company engineers have developed an almost endless number of tests for material under all conditions. These range from giant pressure and tension apparatus to the finest and most accurate devices for measuring stress, expansion and contraction, and other physical changes or conditions in material used.

Perhaps as nearly unique as any other is one of the many tests used in connection with the manufacture of the steering wheels made by the company for a large number of motor car manufacturers. By a highly developed system of manufacture, the rubber rims of steering wheels are bonded to the metal with amazing strength.

Samples of every run of steering wheels are given a special test to make certain that extremes of low temperature will have no ill effect on the finished product. In carrying this out, a Frigidaire portable ice cream cabinet, with two holes, is used. The member between the two holes has been cut away and in the space thus afforded the wheels to be tested are placed. In practice, the wheels are exposed to a temperature of five degrees below zero F., a temperature that would seldom, if ever, be experienced by the wheel in ordinary road use. Wheels under test are exposed to this severe, artificial winter weather for twenty-four hours, and then set in a testing machine, one at a time. An inward bending pressure of 200 pounds is exerted on the rim of the wheel, so as to flatten it. In order to pass the test, the rubber covering of the metal must remain free from cracks or "checking."

Of the thousands of wheels tested, none has shown the slightest sign of failure under this severe test. The frigidaire readily develops the temperature of five (5) degrees below zero, and could produce one of thirty (30) degrees below zero, if that were required for the test.

"Children of Depression"

PARTICULAR interest at the Fourteenth Exposition of Chemical Industries, held recently at Grand Central Palace, New York City, was directed to the exhibit of the American Chemical Society under the arresting title of "Children of Depression." This display comprised more than a hundred new developments commercialized since January, 1930, as a result of research work largely due to the depression. Exhibits in this group of especial significance to the rubber industry included the following:

DIPHENYL DERIVATIVES. Xenene (diphenyl) used as a heat transfer agent and as an intermediate in synthesis, orthoxenol (*o*-phenylphenol), a germicide and fungicide also used in the rubber industry, and paraxenol (*p*-phenylphenol), a raw material for resin synthesis, are all derivatives of diphenyl new since 1930. (Dow Chemical Company.)

DOETEX. A specially treated, rain-proof fabric having superior draping qualities. The fabric is coated first with rubber and then with a cement coat in which cotton flock is embedded. It is available in a variety of colors and used in the manufacture of women's sport jackets, rainwear, handbags, etc. (E. I. duPont de Nemours & Company, Inc.)

DUPRENE. Plastic polymer of chloroprene (reaction product of monovinylacetylene and hydrochloric acid) and a stable emulsion of it in water (Duprene latex). It is used for manufacture of oil-, solvent-, acid-, and heat-resisting and super-aging rubber-like products. (E. I. duPont de Nemours & Company, Inc.)

PLIOFORM AND PLIOLITE. A rubber derivative, available in Plioform as a thermoplastic molding material, and in Pliolite as a flexible resin vehicle. Low moisture absorption, acid- and alkali-resistance, etc., are unique properties invaluable in both adaptations. (Goodyear Tire & Rubber Company, Inc.)

TERPENE SOLVENTS. Dipentine, solvent for varnishes containing synthetic resins. Solvenol, a terpene derivative allied to turpentine but having distinctive solvent powers for resins, rubber, etc. (Hercules Powder Company.)

THIOKOL. A synthetic, rubber-like material which may be described as a polymethylene-polysulfide reaction product. Analysis shows it to contain 15.5 per cent carbon, 2.15 per cent hydrogen, and about 82 per cent sulfur, chemically combined. It is unaffected by paraffin hydrocarbons and oils and vegetable oils, and is only slightly affected by a variety of solvents, including the coal-tar solvents and those used in lacquer manufacture. It is largely used in hose, gaskets, etc., which must withstand these solvents. (Thiokol Corporation.)

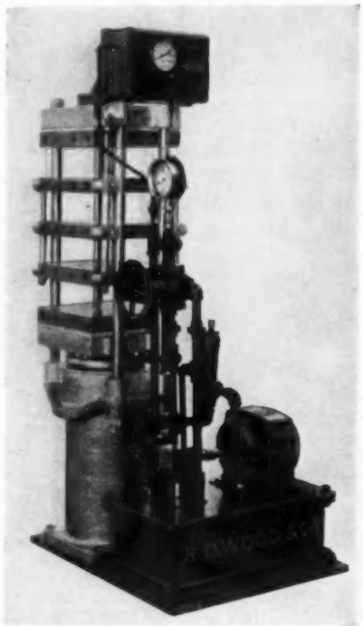
New Equipment

Hydraulic Vulcanizing Press

TO SATISFY the demand for a compact and flexible vulcanizing press unit as required by manufacturers of surgical rubber goods and similar products, R. D. Wood & Co., Philadelphia, Pa., has developed a line of such presses. The press illustrated is equipped with hot platens made of rolled steel plates and drilled from the solid for insertion of electric heating units. The temperature of each platen can be easily controlled and kept constant by an automatic temperature regulator.

The moving platen is firmly guided on the machined press columns. To prevent leakage through the stuffing box, specially constructed packing is being used. The pressure fluid is furnished by a rotary oil pump which is direct connected by means of a flexible coupling to the small electric motor, both units being mounted on a welded steel suction tank.

In order to change the tonnage of the press to suit the work in hand, an adjustable automatic pressure switch mounted on the top platen is furnished. The motor is started by a push button and when the pressure at which the automatic switch has been set is reached the motor is knocked out and the pressure maintained in the press



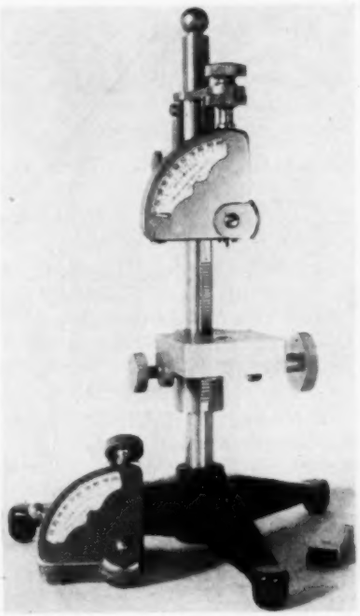
cylinder during the entire curing period by means of a check valve of special construction. Should, however, the pressure drop only a slight amount, the automatic pressure switch will immediately start up the motor and again build up the pressure in the cylinder. The pressure regulation is very simple, consisting of turning a knob until the finger on the dial points to the desired pressure.

The pressure ram is controlled by a simple operating release valve. To afford additional protection a pressure safety valve is also installed in the pipe line. These presses are made in various sizes and capacities and with single or multiple openings. They operate very quietly and therefore can be installed in laboratories located in office buildings. If so desired, the hot platens also can be arranged for steam heating.

Shore Durometer and Elastometer

IMPORTANT improvements have been included in the latest models of the Durometer and Elastometer manufactured by the Shore Instrument & Manufacturing Company, Jamaica, N. Y. One of these relates to a balanced size of the abutment through which the impresser pin operates and which makes for a better constancy under variations of surface conditions and applicational pressure. Another is an adjustable shield to protect the sensitive impresser pin and the interior mechanism from injury when not in use, especially when removed from the operating stand.

Refinements to facilitate calibration through internal ad-



justment, further providing for constancy, have also been added. In the Durometer and Elastometer no sliding parts whatever are used, which does not only mean minimized friction, but accounts for the success with which they have been applied amid chemicals and grit encountered, especially in the rubber works.

Hardness is the qualitative property most measured in determining the proper cure of rubber, and when a high degree of its natural elasticity is to be retained (pliable grades) the Type "A" Durometer is used. The hardness degrees registered are convertible to pressure per unit area, in terms of which rigidity is most commonly measured.

The Elastometer is used for determining the surface elasticity of the pliable rubbers, which is convertible into approximate percentage of elastic stretch. The test is adapted to the surfaces of finished work without injury. Elasticity in terms of the Elastometer is included in specifications when the rubber is to be subjected to high duty service and when its efficiency as resistance to wear or injury under the required stress frequency and load sustaining power depends on a stipulated quantitative value. This value is obtained by multiplying the hardness degrees by those of the elasticity.

THE best statistical section in any rubber journal in the world is published in every issue of THE RUBBER AGE. *Consult it regularly to keep posted on the statistical position of every branch of the rubber industry.*

Code Authorities Are Named

DEVELOPMENTS in the operation of the new codes of fair competition for the tire and rubber industries during the month centered chiefly about the selection of representatives of the trade to act as members of the various code authorities. The members and alternates for the Tire Code Authority, who were elected in New York on January 9, and the members of the Divisional Code Authorities for the general rubber manufacturing industry thus far chosen are listed below:

TIRE CODE AUTHORITY

Members

F. B. Davis, United States Rubber Company
H. S. Firestone or J. W. Thomas, Firestone Tire & Rubber Company
P. W. Litchfield, Goodyear Tire & Rubber Company
J. D. Tew, B. F. Goodrich Company
F. A. Seiberling, Seiberling Rubber Company
W. O'Neil, General Tire & Rubber Company
I. Eisbrouch, McClaren Rubber Company
C. Borland, Mohawk Rubber Company

Alternates

J. A. Walsh, Armstrong Rubber Company
W. O. Rutherford, Pennsylvania Rubber Company
C. C. Gates, Gates Rubber Company
J. W. Whitehead, Norwalk Tire & Rubber Company
A. A. Garthwaite, Lee Rubber & Tire Corporation
Carl Pharis, Pharis Tire & Rubber Company
J. A. MacMillan, Dayton Rubber Manufacturing Company

Ex Officio Members

W. H. Lalley, Kelly-Springfield Tire Company (as Chairman, Rubber Manufacturers Assn.)
A. L. Viles, Chairman of the Authority (as President and General Manager, Rubber Manufacturers Association)

MECHANICAL GOODS DIVISIONAL CODE AUTHORITY

Members

J. H. Connors, Chairman, B. F. Goodrich Company
C. D. Garretson, Electric Hose & Rubber Company
H. N. Young, Alternate Chairman, Hamilton Rubber Manufacturing Company

Alternates

W. C. Winings, Goodyear Tire & Rubber Company
P. H. Henkel, Continental Rubber Works
A. C. Kingston, Boston Woven Hose & Rubber Company

HEEL AND SOLE DIVISIONAL CODE AUTHORITY

Members

R. E. Drake, Avon Sole Company
M. Eisen, Holtite Manufacturing Company
R. H. Cory, O'Sullivan Rubber Company
T. Dabney, Goodyear Tire & Rubber Company
Miah Marcus, Panther-Panco Rubber Company

Alternates

H. T. Mason, Alternate Chairman, Quabaug Rubber Company
Sol Schwaber, Monarch Rubber Company
H. S. Maddock, Essex Rubber Company
H. A. Derry, United States Rubber Company
M. D. Maskrey, B. F. Goodrich Company

FOOTWEAR DIVISIONAL CODE AUTHORITY

Members

T. J. Needham, Chairman, United States Rubber Company
A. H. Wechsler, Converse Rubber Company
C. E. Speaks, Firestone Footwear Company

Alternates

A. B. Newhall, Alternate Chairman, Hood Rubber Products Company
C. E. Little, Servus Rubber Company
J. F. Muffley, Endicott-Johnson Company

FLOORING DIVISIONAL CODE AUTHORITY

Members

O. C. Pahline, Chairman, Goodyear Tire & Rubber Company
W. G. Titus, Hamilton Rubber Manufacturing Company
M. A. Turner, Stedman Rubber Flooring Company

Alternates

Paul Coste, Alternate Chairman, United States Rubber Company
W. I. Lewis, Boston Woven Hose & Rubber Company
H. T. Mason, Quabaug Rubber Company

HARD RUBBER DIVISIONAL CODE AUTHORITY

Members

F. D. Hendrickson, Chairman, American Hard Rubber Company
J. A. Smith, Hood Rubber Products Company
D. N. Hill, Vice-Chairman, B. F. Goodrich Company
H. T. Fowler, Continental Rubber Works
J. L. Hunter, Ahlbell Battery Container Corporation

Alternates

Bruce Bedford, Luzerne Rubber Company,
O. S. Dollison, Republic Rubber Company
S. H. Renton, Vulcanized Rubber Company
S. T. Campbell, Aetna Rubber Company
W. H. Martindell, Joseph Stokes Rubber Company

RUBBER SUNDRIES DIVISIONAL CODE AUTHORITY

Members

F. T. Lane, Chairman, Seamless Rubber Company
H. A. Bauman (Bathing Apparel), B. F. Goodrich Company
F. J. Wilson (Rubber Gloves), Wilson Rubber Company
H. B. Elmer (Stationers), Eberhard Faber Rubber Company
T. W. Casey (Druggist, etc.), Seiberling Latex Products Company

Alternates

T. W. Casey, Seiberling Latex Products Company
W. R. Douglas, United States Rubber Company
H. P. Croxton, Massillon Rubber Company
Robert Sauter, A. W. Faber, Inc.
E. I. Kilcup, Davol Rubber Company

Rubber Mill Rolls for Heavier Duty

(Continued from page 218)

of costly alloys; its increased molding costs; its decreased percentage of yield as compared to chilled iron; and the heat treatment expense. Its present field, therefore, is in applications where cast iron is found to be too weak.

The corrugated roll is not subjected to so great a price handicap. The decreased weight required for adequate strength, as compared with cast iron; and the decreased cost of machining the steel in its soft condition as against machining hard chilled cast iron—makes the cost of the finished roll closely approach that of the old iron roll. It can economically be used as a replacement, when the old type corrugated rolls are discarded.

Rolls of both types also have another decided advantage which has added significance in these days when operating costs are being closely scrutinized. Their excess strength permits a reduction in the necessary diameter of the journals, which makes it possible to use antifriction or roller bearings. The advantages accruing from the use of such bearings are well known, and it is unnecessary to amplify this point. An 84-inch mill frequently develops pressures of 750,000 pounds. When chilled iron rolls are used, the tremendous stresses set up prohibit a reduction of the journal diameter below the present 17 inches. Since the rolls are 22, 24 and 26 inches in body diameter, insufficient space is allowed for roller bearings even when the rolls are new. With MacHemplte rolls, the journal diameters are reduced sufficiently to permit the use of any standard roller bearing.

One official of a large rubber company has predicted that the MacHemplte type of roll will ultimately be used in all heavy duty service in the rubber industry.

Rubber in 1934 Automobiles

(Continued from page 216)

Brake System

Rubber latex is becoming more general as a bonding medium in brake lining. In mechanical braking systems there was little use for rubber, but it is vital to modern hydraulic or air brakes. In these it is used for cylinder boots, seals and vacuum tube hose.

For more effective gripping, brake pedals are covered with rubber pads, either slipped on or vulcanized direct to the pedal. Incidental uses of rubber in the brake system include cable grommets, brake operating lever boots, brake cable boots, operating rod covers, pedal stop, lever stop bumpers, power cylinder anchor bracket and a rubber sleeve protecting the plunger on the cylinder assembly.

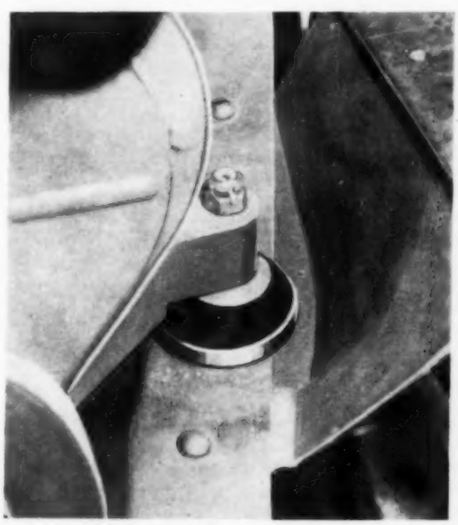
Steering System

The hard rubber steering wheel rim is now general in modern cars. Other common applications of rubber are found in the steering column support pad and steering column grommet.

Hudson and Essex fit a flexible rubber bushing into the tie rod socket for shock cushioning and rattle prevention. Oldsmobile also uses rubber bushings at this point to prevent rattle and obviate lubrication, and Studebaker has a rubber steering tie rod joint. Ford employs a rubber bush to each steering lever, the object being to prevent any rattle developing at each end of the track rod and to provide cushioned steering.

Electrical and Lighting Systems

Rubber is, of course, used for insulators and wire covering and as a constructional material for batteries and battery boxes. However, cheaper materials are now frequently employed in battery construction and also for the various hard-molded insulating items.



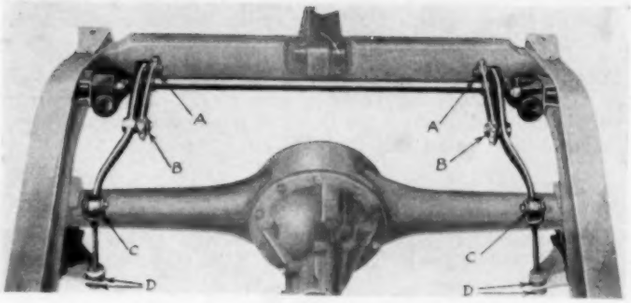
Auburn Engine Mounting

A type that literally cradles the engine in air and rubber

In addition, rubber finds a place in grommets for various cables, lamp bracket pads, ignition lock cable retainer, horn mounting bracket insulator and horn projector grommet.

Miscellaneous Applications

In the exhaust system, rubber has been employed to eliminate one more source of rattle by mounting the muffler assembly on supports of this material in the Studebaker, Cadillac and other cars. It is also used for the muffler and tail pipe mounting bracket grommets.



Rubber in the Oldsmobile Ride Stabilizer

Arrows indicate the ten points in the construction of the stabilizer bar and its hook-up through rigid lengths to the axle pad where rubber is used for cushioning effect. The steel pins lock the stabilizer bar and shock absorber arm together as an assembly for an outside core of rubber. The rigid link extending from the shock absorber arm to the axle pad is rubber cored at the upper end, while the lower end is cushioned both above and below

Numerous incidental applications of rubber are to be found in many of the 1934 cars. A few of these include running board stone deflectors, folding trunk rack grommets, tire cover bumpers, tire carrier grommets, rear view mirror bracket grommets, trunk lid seal, gas tank filler neck hole cover and fender flaps.

Uses for rubber are, therefore, continually increasing in the modern motor car. New applications will unquestionably be introduced from year to year, and some, such as the proposals for rubber upholstery and rubber suspension systems, may involve the consumption of a considerable quantity of the crude product.

Several other suggestions have already been advanced, certain of which have found favor in the accessory field. In England, for example, an all-rubber cap is now commonly slipped over the face of headlights during foggy weather. Experiments have been made in this country with rubber bumpers, and certain engineers have even advocated rubber fenders. In fact, the Mercedes Benz Company has shown a model in which the fenders are fitted with rubber edges. Compositions of rubber, such as the Automotive Super-Lexide of the United States Rubber Company are being developed for foundation boards, door panels, cowl panels and similar uses.

As the automotive industry progresses, the properties of rubber will undoubtedly give it a place of increasingly greater importance as a constructional material.

Change in Volume of Rubber on Stretching

RUBBER shows the anomalous property of decreasing in volume when it is stretched. Other substances increase in volume. Some measurements of the volume decrease on stretching were undertaken at the Bureau of Standards in order to obtain precise values for Poisson's ratio to be used in the determination of the photoelastic constant of rubber.

The striking observation was made that the volume decrease was not instantaneous but required several minutes for its completion. This effect is not a function of the change in tension with time, because the behavior on successive cycles of stretching is identical.

The effect apparently depends on the time lag in the development of the fiber structure of stretched rubber which was recently discovered by Professor Davey and his colleagues of State College, Pennsylvania, in connection with X-ray diffraction patterns of stretched rubber.

REVIEW SHELF

• Monthly Review of New Books, Pamphlets, Company Catalogs, Service Bulletins, House Organs, etc., Pertinent to the Industry.

FIFTEENTH REPORT ON NATIVE RUBBER CULTIVATION. By A. Luytjes and C. J. van Bylert. Published by the Bureau of Agricultural Economics, Buitenzorg, Java. 16 pp. 1933.

Detailed figures of production in the Netherlands East Indies are carried through the second quarter of 1933 in this report. A chart is included to show the trend of production or export from leading sources from 1931 to 1933.

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RUBBER COMPOUNDING MATERIALS. Published by the Barrett Company, 40 Rector Street, New York City. 36 pp. 1934. For free distribution.

Coal tar and coal tar products have been used in rubber compounding since the middle of the last century, when vulcanized rubber products were first manufactured, and the Barrett Company's development work in this field has kept pace with the rapid growth of the industry. The formulas and other data offered in this booklet will be a practical help in the solution of many rubber manufacturing problems.

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THE STORY OF THE TIRE. Published by the Goodyear Tire & Rubber Company, Akron, O. 48 pp. 1933. For free distribution.

To supply a popular demand on the part of students and others for information on the production and manufacture of rubber, a new edition of this interesting brochure has been issued. It is profusely illustrated and covers the high points of the industry's history, as well as the details of rubber cultivation and tire manufacture.

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TRENDS OF MANUFACTURING COSTS IN THE AUTOMOBILE TIRE AND INNER TUBE INDUSTRY, 1914 to 1931. Published by the Rubber Division, U. S. Department of Commerce, Washington, D. C. 20 pp. 1933.

While costs of materials and labor show declines for the tire industry from 1923 to 1929, other costs, which include fixed charges, overhead, salaries and profits, record a sharp advance. This "other costs" element of expense is, therefore, the only one which has been steadily rising, and in the tire industry it ranked in importance equal almost to materials in 1931.

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RUBBER FLOORING AND FURNISHINGS. Published by the Rubber Growers' Association, Inc., London. 26 pp. 1933. For free distribution.

Until a few years ago, rubber was not considered seriously for interior furnishing. Today, however, improvements have made rubber flooring popular and are beginning to establish a place for rubber panelling, rubber-backed carpeting and even upholstery of latex sponge or latex-treated hair. Such uses are even more general in England than in this country, and typical examples are illustrated in the pages of this reprint.

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ANNUARIO DELLE MATERIE PLASTICHE. Published by P. A. Pollini, Via Torino, 47, Milan, Italy. 432 pp. 1934. 20 lire.

Formerly issued as a part of a combined Rubber and Plastics Year Book, this volume is now published separately for the plastics industries. It contains a wealth of material on the manufacture of plastic products and is copiously illustrated. A 1934 Italian Rubber Year Book will be issued by the same publisher later this year.

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BOOK OF A. S. T. M. STANDARDS. Part I, Metals, 1,000 pp. Part II, Non-Metallic Materials, 1,300 pp. 1933. Either part, $7.50; both parts, $14.

BOOK OF A. S. T. M. TENTATIVE STANDARDS. 1,140 pp. 1933. $7.

INDEX TO A. S. T. M. STANDARDS AND TENTATIVE STANDARDS. 124 pp. 1933. For Free Distribution.

These volumes, issued by the American Society for Testing Materials, Philadelphia, Pa., are, of course, essential to manufacturers, designers and engineers who must have access to the standard specifications, methods of testing, definitions of terms and recommended practices contained in their pages. Of the adopted standards, those contained in Part II on Non-Metallic Materials are of greatest interest to rubber technologists inasmuch as this volume includes those relating to rubber products, textiles and electrical insulating materials. The 1933 Book of Tentative Standards has 40 items in these three groups. The Index covers these volumes as well as the *Proceedings* of the Society and is valuable for ready reference.

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KAUTSCHUK. By Dr. Gustavkarl Hubner, Introduction by Dr. Ernst A. Hauser. Published by Chemisch-technischer Verlag Dr. Bodenbender, Feuerbachstrasse 56, Berlin-Steglitz, Germany. Price, 15 RM. 275 pages with illustrations and diagrams. Indexed. 1933.

A compendium of information on the history and botany of rubber considered from an economic standpoint. The subject matter is not confined solely to plantation rubber but includes South America, Central America, Mexico and other producing centers. Tables and diagrams are given for world production and consumption for the period from 1900 to 1931. The effect of reclaimed rubber, latex and other allied substances is also discussed. The subject is discussed in non-technical terms from the standpoint of its trade importance.

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A PRACTICAL GUIDE FOR TIRE COMBINATIONS ON 1½ TON TRUCKS. Published by the B. F. Goodrich Company, Akron. 4 pp. 1934. For free distribution.

Use of the proper size of tire greatly reduces tire cost per mile of operation. A table to be used as a changeover guide for 1½ ton trucks gives the payload in pounds, tire size, rim size and dual spacing in inches for both the 131 and 157 inch wheel base, and illustrates the application of single tires, proper dual spacing, and dual installations.

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AMERICA SELF-CONTAINED. By Samuel Crowther. Published by Doubleday, Doran & Company, Garden City, N. Y. 340 pp. 1933.

"For the first time," says Mr. Crowther, "America is practically self-contained and should depend upon her own resources. There is scarcely one important commodity we need import. We can even produce rubber synthetically." Apart from his reputation as a writer for popular magazines, the author will be remembered as collaborator with Harvey S. Firestone in the volume *Men and Rubber*.

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INFLATION DELAYS RECOVERY. By Allen W. Rucker and N. W. Pickering. Published by the Farrel-Birmingham Company, Ansonia, Conn. 16 pp. 1933. For free distribution.

In this fifth of a series of "booklet-editorials," the authors assert that silver coinage and greenback issuance through gold revaluation will be unavailing as they can scarcely do more than replace check money. Lack of confidence in the future is delaying purchases of capital goods in their opinion, and this lack is largely inspired by the present monetary policy of the government. Mr. Pickering is president of the Farrel-Birmingham Company and his opinions must be accorded importance as representing the viewpoint of a recognized industrial leader.

Editorial Comment

Tire Industry Gains

REVIVAL of activity in the tire factories of the country almost to "boom" proportions should be considered an auspicious development if it is based on a sound foundation and appears likely to continue. Sudden spurts in production and sales that quickly fade away only obstruct the normal course of the industry.

In this case, however, the stepping up of production schedules would seem to have a firm basis. The orders that are pouring into motor car factories indicate that this year's automobile output will far exceed that of 1933. Meanwhile, those motorists who have so long been postponing the day of tire replacements for their present cars must finally enter the market and add their purchases to the original equipment demand.

So conservative a statistician as W. F. Bloor, of the Goodyear Tire & Rubber Company, estimates that unit sales for the industry will be up at least 8 per cent over 1933. With the anticipation of this demand and the expectation of at least some recovery in general business and purchasing power, there would seem to be little to fear in the current burst of activity. The fact that it has been accompanied this year by appreciable wage increases also augurs well, and, while the January production rate may be reduced in coming months, there is every indication that 1934 as a whole will be a good year for the industry and will lead it far along the way to more prosperous times.

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Special Brand Tire Business

FOR years arguments pro and con the manufacture of special brand tires have disturbed the rubber industry. A definite culmination of these arguments will probably emerge from the hearings now being conducted by the Federal Trade Commission into the details of the Goodyear-Sears, Roebuck contracts and business relations.

Regardless of the merits of either side of the case, it will unquestionably be well for the participants and for the industry as a whole to have the entire problem brought to a final settlement. So long as this situation has been hanging fire, it has only served to confuse merchandising conditions in the tire trade. Disposal of these arguments will clear the tire marketing picture and enable every member of the industry, whether manufacturer or distributor, to know exactly where he stands and to shape his policies accordingly.

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Sir George on the Codes

COMMENT on our domestic problems by distinguished members of the industry in other countries is always to be welcomed and is usually interesting and constructive in nature. Of this type are the remarks offered last month with regard to our industrial recovery program by Sir George Beharrell of Dunlop.

Speaking at the annual dinner of the Institution of the Rubber Industry, of which he is president, Sir George declared, "We in this country have reason to be thankful for the fact that we can use our good sense and get together and try to improve our industry. I believe that we shall do so. We do not want to be told what we can do and what we may not do. I hope this industry will not be one to have the finger of scorn pointed to it as not being able to manage its own affairs."

In particular, Sir George pointed to the requirement that every American casing must in future have molded on it the number of plies it contains. "So we may have some honesty as to what tires really consist of," he is reported as having added amid laughter from his audience.

Little answer can be made to such criticism, particularly when it comes from so eminent a source. The British industry is truly to be congratulated upon the picture of generous cooperation it presents. But the picture would be even brighter and the criticism even more incisive if Sir George's own country could point to a record of continued company prosperity without the failures, bankruptcies, forced mergers and losses to investors that have been only too common in recent years.

CURRENT • NEWS of the Rubber Industry

FEBRUARY, 1934

Tire Factories Increase Production Rate, Raise Wages, as Higher Prices Are Rumored

Boom in Automobile Industry Causes Unprecedented Midwinter Demand for Tires—Activity Approaches 1929 Pace at Akron and Other Rubber Centers

EXCEPTIONAL midwinter demand for casings and tubes, stimulated by the boom at automobile plants, has resulted during the past month in a rate of production at tire factories exceeded only by the peak record of 1929. Increased production schedules were accompanied by a 10 per cent raise in wages for workers.

Meanwhile, persistent rumors prevailed that a substantial increase in tire prices would be seen this month. Basis for these reports was to be found not only in the operation of the new tire industry code but also in the sharp increase in the price of crude rubber since the beginning of the year.

The unusual demand for tires has been created through original equipment orders to meet the needs of the automobile factories. Detroit and other motor car centers have been swamped with orders themselves since the first of the year and, in some cases, find their production falling behind sales. Estimates that 1934 will witness the production of 3,000,000 cars are now general, and this is expected to raise total tire sales to at least 50,000,000 this year.

In Akron alone the pay increase, which went into effect February 1, will mean an annual gain of more than $6,000,000 in the earnings of 40,000 workers. The Goodyear Tire & Rubber Company increased base and hourly rates for its 12,000 tire, tube and engineering department workers and is stepping up the work-week of its 2,000 mechanical goods, rim plant and reclaiming plant workers from 36 to 40 hours with slight increases in pay rates. Goodyear's present Akron force of 14,000 compares with its April, 1933, payroll of only 9,500, who were working from 18 to 24 hours a week.

Wages Exceed 1929 Rate

In the case of Goodyear, which is typical of other tire plants, the average hourly wage has been boosted to a point nearly 10 per cent higher than that of 1929. Goodyear states that its 17,800 employees on an hourly basis in January, 1929, had average hourly earnings of 79.9 cents. At present it is estimated that its 1934 force of 14,000 workers will have hourly earnings of 85.5 cents. The individual weekly wage is, however, still lower than that of five years ago, since rubber workers are employed only six hours a day.

Officials of the B. F. Goodrich Company announced that their wage scale would be raised to a similar extent for their 12,000 Akron workers. Increases for 9,000 employes were announced by John W. Thomas, president of the Firestone Tire & Rubber Company, who stated that the advance for the firm's machine shop workers had been made effective as early as January 17. Curing molds at the Firestone plan which have not been used since 1929 are being heated.

In reporting wage raises for his company's 2,500 employes, Charles F. Burke, assistant to the president of the General Tire & Rubber Company, said, "We're also going to step up working hours right along from now on." Seiberling Rubber Company wages were stepped up, and Penfield Seiberling, sales manager, declared January production to have been 62 per cent ahead of the same month in 1933.

The United States Rubber Company benefited particularly from the heavy increase in production by General Motors, for whom it supplies a great part of all original equipment. The Fisk Rubber Company made wage increases of from 7 to 20 per cent effective January 29. The Mansfield Tire & Rubber Company, through P. H. Ober, vice-president, announced a 10 per cent pay increase, and smaller tire companies throughout the country are believed to have followed the lead of the larger concerns in this step.

Manufacturers of mechanical goods and other lines also report higher activity. The Ohio Rubber Company, Willoughby, O., has greatly increased its working force and has raised wages 10 per cent. The Quaker City Rubber Company, Philadelphia, Pa., finds present factory output 300 per cent ahead of the same time last year.

Tire Price Rise Imminent

Predictions of tire price increases were preceded by reports that factories were making substantial discounts to dealers to enable the latter to meet trade-in allowances offered by the mail order companies. Mail order firms are allowing 25 per cent off on trade-ins, the discount varying according to localities, according to trade reports. In the Chicago area, competition has been particularly keen with discounts rumored as high as 35 per cent. About 17½ per cent has been mentioned by some of the tire manufacturers as the maximum they will allow dealers in order to meet the mail order competition.

However, an increase in tire prices, ranging from 6 to 20 per cent, appeared almost certain at the end of January, with tire manufacturers rumored unable to agree upon the exact amount of the boost. Rising commodity prices as a result of

TIRE PRICE RISE

New York, Feb. 13—As we go to press, a tire price rise of 3 per cent has been announced by the Goodyear Tire & Rubber Company, but other manufacturers have not as yet followed suit. The announcement by Goodyear of the increase in its dealer and retail schedules was made on February 9.

J. D. Tew, president of the B. F. Goodrich Company, asserted definitely on February 12 that his own company is making no changes. F. A. Seiberling, president of the Seiberling Rubber Company, declared the rise to be "17 per cent short of what the increase should be."

the country's gold policy are given as the prime reason for higher tire price schedules. Crude rubber, which was selling at 8¾ cents a pound as late as January 9, had risen to 10⅝ cents by February 6. Cotton also has risen in price, thereby making for appreciably higher manufacturing costs.

RUBBER EXPORTS SHOW GAIN IN DOLLAR VALUE

United States export trade in rubber manufactures registered a 9 per cent increase in value in 1933 over the preceding year, according to figures compiled in the Commerce Department. Total shipments in the two periods were valued respectively, at $17,826,362 and $16,364,678.

A noteworthy feature of this increased trade in 1933, it is pointed out, is the fact that during each of the first six months the exports were lower than for the corresponding month of 1932. The upward trend began in July and continued each month thereafter.

Tires, inner tubes and tire sundries, the most important classification of rubber manufactures entering the export trade, rose from a value of $9,300,787 in 1932 to $10,440,300 in 1933, an increase of 12 per cent; mechanical rubber goods advanced from $1,797,842 to $2,137,498, an increase of 19 per cent, while rubberized fabrics were valued at $420,866, compared with $523,203, an increase of 24 per cent.

Rubber footwear and semi-manufactured goods were the only two items of rubber exports which declined in 1933 compared with 1932. The former dropped 26 per cent, from $784,369 to $580,111, and the latter, 1 per cent, from $1,826,243 to $1,817,309.

GOODYEAR COMPLETING NEW GENERATING UNIT

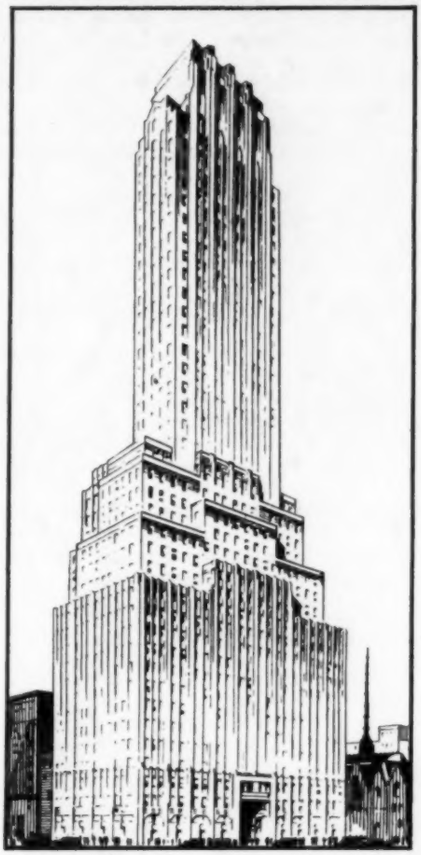
The Goodyear Tire & Rubber Company will shortly place in operation at its Akron plant a new electrical generating unit, constructed at a cost of $700,000 and capable of producing power for three mills a kilowatt hour. Upon the completion of this unit, the company will be able to produce all its own power.

The new unit will include a highly efficient steam turbine and a 75-foot boiler, fired by powered coal jets. With the four other steam turbines now in operation at the Akron factories, Goodyear will have a power capacity of 45,000 kilowatt hours, providing an emergency excess of about 7,500 kilowatt hours. When the new unit goes into production, one of the older pieces of equipment will be taken off the line and held in reserve.

F. R. Henderson Opens Office

Francis R. Henderson, first president of the former Rubber Exchange of New York, has opened an office at 25 South William Street, New York City, where he will act as a commodity counsel, specializing in rubber. During the past two years, Mr. Henderson has been associated with the firm of Clark, Childs & Keech.

New Home of Rubber Association



The Rubber Manufacturers Association, Inc., will move its offices on or about March 1 to 444 Madison Avenue, New York City, pictured above, where it will take the 34th and 35th floors. The need of the Association for larger quarters than the space it has occupied for many years at 250 West 57th Street was due in part to the additional duties it has assumed in connection with the administration of the tire and rubber industry codes.

John Sherwin

John Sherwin, former director of the Goodyear Tire & Rubber Company, died at his home in Cleveland on January 16. He was 65 years old. Mr. Sherwin, who for 30 years was a leading figure in Cleveland banking and industrial circles, played an important part in the Goodyear reorganization in 1921.

FIRESTONE APPEALS FROM PATENT DECISION

Before appealing from the recent adverse ruling in its patent infringement action to a higher court, the Firestone Tire & Rubber Company was required last month to post a bond of $355,000 pending a decision.

The Firestone company was sued by the United States Rubber Company for infringement of patents employed in the manufacture of tires, and the United States District Court at Cleveland ruled against Firestone. The appeal will be taken to the United States Circuit Court of Appeals at Cincinnati.

DOMESTIC CONSUMPTION AT 405,689 TONS IN 1933

Consumption of crude rubber by manufacturers in the United States for the month of December amounted to 29,087 long tons, which compares with 29,162 long tons for November this year, and shows practically no change as compared with November but was 61.5% over December a year ago, according to statistics released by the Rubber Manufacturers Association. Consumption for December, 1932, was reported to be 18,015 long tons. Consumption for the twelve months of 1933 amounted to 405,689 long tons as compared with 332,000 long tons for 1932.

Imports of crude rubber for December were 42,099 long tons, a decrease of less than 1% under November, but 47.4% above December, 1932.

The Association estimates total domestic stocks of crude rubber on hand December 31, at 364,541 long tons, which compares with November 30 stocks of 353,852 long tons. December stocks show an increase of 3.0% as compared with November of this year, but were 3.8% below stocks of December 31, 1932.

The participants in the statistical compilation report 55,606 long tons of crude rubber afloat for the United States ports on December 31, compared with 57,140 long tons afloat on November 30, this year, and 38,360 long tons afloat on December 31, 1932.

December reclaimed rubber consumption is estimated to be 5,951 long tons, production 9,539 long tons, stocks on hand December 31, 20,746 long tons.

FAILURES ARE FEWER IN RUBBER GOODS INDUSTRY

The number of failures in the rubber goods manufacturing industry, as compiled by Dun & Bradstreet, Inc., was reduced to 7 in 1933, as compared with 14 in 1932. The reduction in the loss which these failures entailed was even more marked. In 1933, the defaulted indebtedness shrank to $139,968 from $923,883.

The complete insolvency record of the rubber goods manufacturing industry since 1927 shows:

1927.....	4	$1,576,900
1928.....	6	238,200
1929.....	4	268,000
1930.....	4	67,200
1931.....	8	1,952,170
1932.....	14	923,883
1933.....	7	139,968

Rubber Section Annual Survey

The Rubber Section of the Leather-Rubber-Shoe Division, United States Department of Commerce, is making its annual survey of domestic consumption and stocks of crude and reclaimed rubber for 1933. Questionnaires have been sent to manufacturers for reports on their consumption and stocks and to reclaimers, importers and dealers for their inventories, and a complete consolidated report will be issued as soon as the survey is finished.

HEARING CONDUCTED ON RECLAIMING CODE

A hearing on the proposed code for the reclaimed rubber manufacturing industry was held February 8 at the Raleigh Hotel, Washington, D. C., by Deputy Administrator A. L. Kress. The code provides for a 40-hour week and a wage of 35 cents an hour for workers. Dr. A. Howard Myers served as labor adviser for the hearing at the direction of the Labor Advisory Board.

At the annual meeting of the Rubber Reclaimers Association, Inc., last month, the following officers were elected: President, Louis J. Plumb, U. S. Rubber Reclaiming Company; vice-president, V. H. Dingmon, Xylos Rubber Company; treasurer, E. B. Curtis, Naugatuck Chemical Company. Directors named were William Welch, Midwest Rubber Reclaiming Company; Clark W. Harrison, Bloomingdale Rubber Company; E. H. Brooks, Goodyear Tire & Rubber Company; Mr. Plumb and Mr. Dingmon.

NOVEMBER TIRE OUTPUT 31% HIGHER THAN 1932

Shipments of pneumatic casings for the month of November amounted to 2,197,485 casings, a decrease of 13.4% below October but was 28.4% above November, 1932, according to statistics released by the Rubber Manufacturers Association, Inc.

Production of pneumatic casings for November was 3,039,386 casings, a decrease of 11.4% under October but was 31.9% above November, 1932.

Pneumatic casings in the hands of manufacturers November 30 amounted to 9,246,563 units, an increase of 9.3% as compared with October 30 stocks and 24.0% above stocks November 30, 1932.

The actual figures are as follows:

PNEUMATIC CASINGS

	Shipments	*Production*	*Inventory*
Nov., 1933	2,197,485	3,039,386	9,246,563
Oct., 1933	2,536,971	3,428,658	8,461,735
Nov., 1932	1,711,298	2,303,545	7,454,443

Pirelli to Make Shoes

Manufacture of rubber footwear will be added to the activities of Pirelli, Ltd., Burton-on-Trent, England, according to recent newspaper reports. A new wing is now in construction at the present plant and will be used chiefly for the storage of rubber shoes. The company, which now employs about 500 workers at Burton, will add from 200 to 300 extra employes for the new line.

Goodyear Safety Award

The Stephens safety trophy was presented to the reclaiming plant of the Goodyear Tire & Rubber Company as the winner in the annual Goodyear divisional safety contest, the award being made at an employes night program on January 19. The reclaiming plant had only one accident in 205,339 hours of work. Plant 2, tire division, was second and the chemical division was third.

Dust Explosion at Tire Plant

A dust explosion rocked the Los Angeles plant of the Goodyear Tire & Rubber Company of California last month and was felt over an area of a square mile. The blast occurred in the block-long calender room where tire fabrics are impregnated with rubber. A huge dust-collecting fan broke down and the explosion came while repairs were under way. No employes were injured, but firemen were required to wear gas masks because of the dense clouds of acrid smoke that resulted from the blast.

Move Latex Fiber Sales Office

Henry C. Avery, former vice-president of the Flintkote Corporation, has been appointed sales manager of Latex Fiber Industries, Inc., Beaver Falls, N. Y., and will be in charge of that organization's new sales headquarters at 1790 Broadway, New York City. Latex Fiber Industries, Inc., is owned jointly by the United States Rubber Company and the J. B. Lewis Company and produces Laflex, Insolex, Lexhide and other latex-fibrous combination materials.

Goodrich Safety Contest

After a spirited race, the Philadelphia Rubber Works plant, with an improvement rating of 55.67 per cent, emerged victorious in the John E. Noonan Safety Contest for units of the B. F. Goodrich Company for the six-month period ended December 31. The plant thus annexed its second successive leg of the contest, and a third successive win will give it permanent possession of the trophy. The processing division was in second place with 44.64 per cent, followed by the tire division, the Miller plant, the engineering and miscellaneous division, and the mechanical division.

Soviet Tire Plant Director Demoted for Doubting Plan

M. Michailoff, director of the Yaroslavl rubber factory, has been discharged from that post and sent to occupy a foreman's position in the construction of the Oka Chemical Plant in Siberia, according to the *New York Times*. The reason given for his dismissal was that he questioned the quota of 900,000 tires set for the plant's second year under the second Five-Year Plan, declaring that the capacity of the plant for 1934 was only 450,000 tires.

"If we cut down on vulcanizing and use some other unproved method," he stated in a speech at a plant conference, "we may be able to manufacture 500,000." He further stated that the plant had not been allotted sufficient funds for such a program.

G. K. Ordzhonikidze, Commissar for Heavy Industry, announced his removal, asserting that "a program approved by the government is a law and speaking against an approved program is breaking Communist and Soviet discipline and Soviet law." G. Bitker, chief of Glavresina, has been assigned to take over the duties of director of the plant.

COMPANIES SPEND MORE IN 1933 FOR ADVERTISING

Five leading tire and rubber companies spent $1,992,993 in magazine advertising during 1933 as against $1,990,348 in 1932, according to a tabulation made by the Advertising Record Company from 79 national magazines. The Goodyear Tire & Rubber Company, while spending less last year than in 1932, still remained the leading magazine advertiser. The comparative record in detail follows:

	1933	1932
Goodyear	$597,551	$761,890
Goodrich	453,258	383,407
Including:		
Goodrich Tire	340,123	233,520
Footwear	22,085	23,985
Hood	90,025	125,902
Miller	1,025	(Nothing)
U. S. Rubber	405,596	354,422
Firestone	331,383	306,699
Including:		
Tire	326,615	295,230
Footwear	4,768	11,469
General	205,205	183,930

A similar analysis of advertising expenditure for radio network, broadcasting, however, shows a sharp decrease on the part of tire companies. During 1933 tire manufacturers spent only $347,484 in broadcasting over the National Broadcasting Company and Columbia Broadcasting Company networks, as compared to an expenditure of $772,405 in 1932.

879,460 TONS OF RUBBER TRADED IN SEVEN MONTHS

During the seven months from May 1 to November 30, 1933, crude rubber futures traded in on Commodity Exchange, Inc., totaled 879,460 long tons. This far exceeds the total of 328,710 long tons traded on the Rubber Exchange of New York, Inc., during the entire previous twelve months ending April 30, 1933, it was revealed in the annual report of Commodity Exchange, Inc. Comparative figures show that 132,310 tons were traded in November, 1933, as against only 19,350 tons in the same month of 1932.

The price for March contracts fluctuated during the seven months from a low of 4.95 cents a pound on May 4 to a high of 11.89 cents on July 18.

Fire Sweeps Seiberling Branch

Fire which broke out last month in Fenway Park, home of the Boston American League baseball team, completely destroyed the adjacent Boston branch of the Seiberling Rubber Company. The loss of the three-story building and its contents was placed between $25,000 and $30,000 by J. Penfield Seiberling, vice-president of the company, who stated that it was entirely covered by insurance. The branch is being established in new headquarters.

Goodrich Moves New York Office

The New York executive offices of the B. F. Goodrich Company were recently moved to 230 Park Avenue. They were formerly located at 342 Madison Avenue in that city.

Trade Commission Hearings in Goodyear Case Reveal Details of Sears, Roebuck Contracts

Testimony at Akron and Chicago Discloses Stock Payment to Mail Order House—Goodyear Erected Alabama Factory to Fill Special Brand Business

HEARINGS in the Federal Trade Commission complaint against the Goodyear Tire & Rubber Company began in Akron from January 15 to 26 and were continued in Chicago, the home city of Sears, Roebuck & Company. Testimony was taken from Goodyear and Sears, Roebuck officials and from independent tire dealers, and a protest by 20 tire manufacturers against the special brand business was read.

Goodyear has admitted that its contract calls for the manufacture of tires under brands owned and controlled by Sears, Roebuck & Company on a cost plus 6½ per cent basis from October 5, 1931, to December 31, 1942. It denies, however, that the contract permits any discrimination in price or tends to create a monopoly in violation of the Clayton Act.

Among the highlights of the hearings, it was disclosed that in return for the contract Goodyear turned over to Sears, Roebuck 18,000 shares of the tire company's own common stock and $800,000, with which to purchase 32,000 more shares. These 50,000 shares are currently worth nearly $2,000,000, but Sears is required not to sell any part of this block of stock during the ten-year period of the contract. In explaining that the total cost of the stock to Goodyear was $1,250,000 which is being amortized over the ten-year period, P. W. Litchfield, president of the tire company, declared it "a perfectly legitimate transaction and a mighty good business deal for Goodyear."

The extent of the special brand business was shown by testimony that Goodyear had sold 81,813,000 tires in the five years preceding 1931, with Sears taking 14,799,000, or 18 per cent of the total. The dollar sales totaled $880,540,000, with Sears paying $96,843,000 of the total, or 11 per cent. A breakdown of these figures showed Sears' mail order business to be steadily declining while its retail store sales were rising rapidly.

Credit Adjustments Called Rebates

Goodyear officials testified that sales to Sears were billed on the basis of estimated costs plus approximately 10 per cent, with appropriate credit adjustments being made at the end of each year when actual and exact cost data are available. Trade Commission attorneys, however, attempted to prove that these refunds, which varied from $474,000 in 1926 to $2,515,000 in 1928, were "secret rebates."

A Trade Commission exhibit purported to show that the cost of producing a Sears All-State tire was at times even higher than that for a similar Goodyear All-Weather tire. It was, however, pointed out that the Sears tire prices included crude rubber at net cost, while there were heavy inventory reductions to be figured after the initial factory cost on the All-Weather casings.

R. E. Wood, president of Sears, Roebuck & Company, was shown to have written Mr. Litchfield in 1928, repeatedly urging the construction of a southern branch plant to reduce freight costs. Goodyear's tire factory at Gadsden, Ala., was built in 1929, but on December 9, 1930, Mr. Litchfield wrote to Sears, "As you know, we erected our Gadsden plant at an expense of many millions of dollars, largely on account of our contract with your company, and its capacity has never been needed since it was finished."

The name of the Firestone Tire & Rubber Company was frequently brought into the proceedings as one of the principal complainants against the special brand business. R. S. Wilson, Goodyear sales manager, claimed, however, that he understood that "Firestone tried to get the Montgomery Ward tire business." Other tire makers mentioned as having done special brand business were United State Rubber, Mansfield, Goodrich, Gillette, Samson and Lake Shore. A part of the Sears business had been prorated to the Lake Shore Tire & Rubber Company.

Other Manufacturers Protest

A letter written to Col. Robert W. Lea, assistant NRA administrator, on November 8, 1933, protesting the special brand tire sales of Goodyear, Goodrich and U. S. Rubber, and signed by representatives of 20 tire manufacturing companies, was read into the testimony. The protest was signed by officials of Firestone, General, Mohawk, Master, Murray, Denman, Norwalk, Seiberling, Overman, Schenuit, McClaren, Dayton, Monarch, Armstrong, Pennsylvania, Inland, Standard Four, India, Dunlop and R. C. A.

Other developments in the hearings included an attack by commission attorneys on special brand contracts made by Goodyear with Western Auto Supply Company and more than 15 firms through its subsidiary, the Marathon Rubber Company. Advertising by Goodyear dealers was shown to have termed the Sears tire "a mongrel dog." It was brought out that only nine members of the Goodyear board of 17 were present at the special meeting at which the Sears 1931 contract was authorized, and Fred L. Morgan, then Goodyear's special brand tire department manager, revealed that he knew nothing of the signing of the contract.

PIONEER RUBBER CO. IMPROVES ITS POSITION

The Pioneer Rubber Company, Willard, O., closed 1933 in much better shape financially than at the end of 1932, stockholders were told at their annual meeting on January 16. The expense of new equipment for latex process work has been taken care of, it was reported, and better business conditions this year should enable the company to make rapid gains.

The following directors were unanimously reelected: R. K. Williams, Kenneth L. Milligan, John Clay, C. C. Hessler, J. C. Gibson. Directors elected J. C. Gibson president and treasurer, and K. L. Milligan vice-president and secretary.

GOODYEAR WORKS ON STRATOSPHERE BALLOON

Preliminary work has been started at the Akron plant of the Goodyear Tire & Rubber Company on the 3,000,000 cubic foot balloon in which Captain A. W. Stevens and Major W. E. Kepner hope to ascend 15 miles into stratosphere. The flight, which they expect to make some time in June, is being sponsored by the United States Army and the National Geographic Society.

Work now being done involves the rubberizing of more than three acres of fabric for the huge bag. The balloon is expected to be 300 feet high and 179 feet wide and to carry a nine-foot gondola.

Third Annual Safety Contest

The third annual safety contest conducted under the auspices of the Rubber Section, National Safety Council, will cover the period from January 1 to June 30 and will include most of the major manufacturing companies among its entrants. Companies have been grouped in four divisions for the contest, the main plants of Goodyear, Goodrich, Firestone and United States Rubber comprising the first division, while smaller factories are included in other groups.

Pharis Salesmen Organize

Members of the sales organization of the Pharis Tire & Rubber Company, Newark, Ohio, held a conference on January 18 and 19 and listened to talks by Carl Pharis, A. R. Lindorf, C. O. Lindrooth, A. S. Wyeth, D. M. Stevenson and Ralph Reel. The group then formed the Pharis Wheel Club, an organization composed exclusively of Pharis salesmen, and made plans to meet twice a year in the interest of closer business and personal contacts.

Henderson Elects Officers

The Henderson Tire & Rubber Company, Bucyrus, O., completed the sale of $50,000 in capital stock last month and organized for business by electing C. O. Henderson as president and general manager. John Q. Shunk, president of the Shunk Manufacturing Company, also of Bucyrus, was named vice-president, and William C. Beer was chosen secretary. These officers, with W. J. Schwenck and Frank L. Hopley, will serve as directors. Tire production is expected to start before the first of April.

NEW ENGLAND NEWS

About 80 per cent of 1,500 factory employes of the Fisk Rubber Corporation, Chicopee Falls, Mass., are affected by wage increases varying from 7 to 20 per cent, which became effective January 29. The increases total about $150,000 a year or $3,000 a week. Union officials claim that the plant is now about 97 per cent organized.

Production during January averaged 8,000 tires daily, with a slightly larger number of tubes. Edward D. Levy, president, speaking recently before luncheon meetings of the Advertising Clubs in Boston and New Haven, stated that Fisk's sales from May 21, when the reorganization was effected, to December 31, a period of seven months and 11 days, totalled approximately $6,375,000.

Mr. Levy broke this figure down to show that it represented 1,045,000 tire-and-tube units, at an average sale price per unit of $6.10. He outlined the progress of the reorganization, pointing to a steadily rising sales curve, and expressed optimism as to future prospects.

Robert Lyman Williston, 65, former president of the Easthampton Rubber Thread Company, Easthampton, Mass., and prominent in Western Massachusetts industrial activities for many years, died suddenly January 11 at his home in Northampton. He is survived by his wife and two sons.

J. W. Hanson, executive of Richards & Company, Stamford, manufacturer of rubberized fabrics, has been elected president of the Stamford Manufacturers' Council, which is affiliated with the local Chamber of Commerce.

Directors and officers of the Omo Mfg. Company, Middletown, Conn., manufacturer of dress shields and specialties, were re-elected at the annual meeting January 24. Frederick B. Fountain is president and treasurer; Dale D. Butler, vice-president, and Frank E. Ferree, secretary. The board of directors includes the officers and Philip J. Stueck, Francis A. Beach, Earl R. Hudson, Richard J. Goodman, E. J. Paul and James W. de Graff.

A multiflex automobile seat employing sheets of rubber running lengthwise and crosswise which are supported on a frame at their ends has been patented by Julius Kletsky, president of Jefferson Auto Specialties, Inc., Springfield, Mass. According to the patent claim, the rubber sheets do not touch one another when they bend, and this independent flex is said to afford a free upward and downward movement which allows elasticity. After being depressed by continuous use, the seat may be restored to its original shape by inflation of a pneumatic member in the bottom.

The Goodyear Rubber Company, Middletown, Conn., manufacturer of rubber footwear, has embarked upon a program of modernization, replacing a number of machinery units and installing additional equipment which will increase plant capacity. The total number of employes on February 1 was about 500, as compared with 1,000 during the recent peak season, but the number will probably be increased as orders accumulate during the late winter and spring. Harold S. Guy is president of the corporation and Charles M. Park, treasurer.

Mason Brayman Starring, 74, father of David Swing Starring, president of the Wheeler Insulated Wire Company, Bridgeport, Conn., died in New York City, January 31. The elder Mr. Starring was a prominent Midwestern railroad executive and former president of the United Railways Investment Co.

The footwear division of the United States Rubber Company at Naugatuck, Conn., will probably keep 5,000 workers employed during 240 working days in 1934, as against 201 days last year, Walter H. Norton, president and general manager, told a factory council meeting January 4.

Jenkins Bros., Bridgeport, Conn., manufacturers of mechanical rubber goods used in the valve industry, held a sales convention at its Bridgeport plant February 5-7. Farnham Yardley, president, and C. B. Yardley, sales manager, were principal speakers during the convention, which brought together the sales, credit and engineering staffs.

C. E. Toomey, vice-president and mechanical superintendent of the R. H. Smith Mfg. Company, Springfield, Mass., manufacturers of rubber printing plates and rubber stamps, for nearly 20 years, was elected president at the annual meeting January 31, filling the vacancy caused by the recent death of Arthur P. Smith. He will also serve as assistant treasurer and superintendent and Harry Jonas will be vice-president and treasurer.

The Sponge Rubber Products Company, operating plants in Derby and Shelton, Conn., enjoyed an excellent production volume in January and prospects for February and March are highly encouraging, William R. Todd, secretary and treasurer, told THE RUBBER AGE. Sponge rubber balls and automobile upholstery parts make up the bulk of the company's production at this season, he said.

Charles Brown Whitney, 73, vice-president and treasurer of the Wright & Ditson Victor Company, Springfield, Mass., before its consolidation with A. G. Spalding & Brothers, Chicopee Falls, in 1929, died January 28 after a long illness. Mr. Whitney organized the Victor Sporting Goods Company at Chicopee Falls in 1898 and moved the business to Springfield two years later. The Victor company was later merged with the Wright & Ditson Company, which became the Wright & Ditson Victor Company, continuing under that name with Mr. Whitney as officer and manager of the Springfield factory until the consolidation with Spalding.

TRENTON NEWS

A general conference of executive managers and salesmen of the Vulcanized Rubber Company, Morrisville, Pa., was held early in January at the Hotel Hildebrecht, Trenton, N. J., when reports relative to the coming year's business were received. S. H. Renton, president, announced that some of the concern's departments were operating to capacity and that business for the coming year was very encouraging.

Harry Roberts, president of the Pierce-Roberts Rubber Co., Trenton, is a member of the present United States grand jury.

William J. B. Stokes, president of the Joseph Stokes Rubber Co., Trenton, is recovering at his home from a recent fall on the ice when he injured his leg.

Paul O. Gunkel, general manager of the Joseph Stokes Rubber Co., Welland, Ontario, Canada, is reported to be seriously ill at his home.

Alligator Rubber Company, 1420 Lefcourt Building, Newark, has been incorporated at Trenton with $50,000 preferred and $25,000 common stock to manufacture all kinds of rubber. Albert Lowenstein, of 110 Lillie Street; Margaret Hanson, of 504 South Belmont Street, and George Block, of 268 Schuyler Street, all of Newark, are the incorporators.

Pierce-Roberts Rubber Co., Trenton, is now operating with two shifts in the manufacture of radio parts.

A ruling of the Third Circuit Court of Appeals sustaining Federal estate taxes imposed upon eight trusts created by George R. Cook, of Trenton, has been sustained by the United States Supreme Court. Cook, who was a prominent Trenton rubber manufacturer, created the trusts, totaling approximately $1,000,000, for the benefit of his widow and three children, who were to share equally under them. The commissioner of internal revenue ruled the property included in the trusts must be included in the gross estate of deceased for Federal estate tax purposes. The Trenton Trust Co. and other executors of the estate insisted the trusts were irrevocable and therefore not a part of the estate of Cook subject to the Federal estate tax. Mr. Cook died in 1926. He was president of the Acme Rubber Manufacturing Company, and the Hamilton Rubber Manufacturing Co.

Names in the News

P. N. ZMY, chemical engineer associated with the rubber and asbestos industries of Soviet Russia, was a visitor at the Akron plants of the B. F. Goodrich Company last month.

W. F. BLOOR, statistician of the Goodyear Tire & Rubber Company, declared his opinion that the new year was off to "a healthy start" in a talk before members of the Akron Rotary Club last month. "Real confidence in the outlook at last seems to have been definitely renewed," he said, "after more than four years of fear toward the future."

ARTHUR D. BENEDICT has been named as vice-president in charge of sales of the Barr Rubber Products Company, Sandusky, O. Mr. Benedict, who comes from Chicago, has had wide experience in sales management.

NORMAN A. GLANTZ, formerly in charge of advertising and sales promotion in the Chicago district of the B. F. Goodrich Company, has been transferred to the Akron offices as assistant to E. T. TUCKER, manager of tire advertising. He will assume charge of retail store advertising, succeeding JAMES J. COCHRAN who was recently made assistant to J. A. HOBAN, general manager of Goodrich retail sales.

W. D. ZAHRT, assistant treasurer of the Firestone Tire & Rubber Company, has been selected as secretary and treasurer of the newly formed Automotive Credit Service, Inc. This organization has its headquarters in the General Motors Building, Detroit, Mich.

L. CLAYTON MCKENNEY, employment manager of the Hood Rubber Company, spoke at the office management conference held at the Hotel Statler, Boston, Mass., on February 9 under the auspices of the American Management Association. His topic was "The Effect of Shorter Work Week on Vacation Policies for Office Workers in 1934."

JAMES S. PEDLER, of the aeronautics department of the B. F. Goodrich Company, acted as a member of the contest committee for the Pan American Air Races held in New Orleans from February 9 to 13.

E. S. BURKE has been appointed assistant general manager of the Kelly-Springfield Tire Company with full charge of all departments except factory operation. He was formerly vice-president of the Fisk Rubber Company.

DR. H. L. TRUMBULL, manager of chemical research of the B. F. Goodrich Company, has been elected president of the board of education of Hudson, O. He originally became a member of the board last fall.

ERNEST I. KILCUP, executive manager of the Davol Rubber Company, addressed a joint meeting of the National Association of Cost Accountants, Providence Chapter, and the Rhode Island Association of Credit Men at the Biltmore Hotel, New York, on January 29. His subject was "Manufacturing Costs and Their Relation to Credit." Mr. Kilcup is also president of the National Association of Credit Men.

FRANK FENTON, general superintendent of the Miller Rubber Products Company, Inc., was recently appointed a member of the Akron Boxing Commission.

RAYMOND W. BOYD, tire development engineer of the B. F. Goodrich Company, sailed on January 12 for Yokohama, Japan, where he will join the technical staff of the Yokohama Rubber Company, Ltd., manufacturers of Goodrich rubber products in Japan.

ARTHUR LARKINS has been appointed general sales manager of the Steelcote Manufacturing Company, makers of rubber enamel at St. Louis, Mo. He was formerly vice-president and sales director of the Martin-Senour Company, Chicago division of the Sherwin-Williams Company.

DR. I. DROGIN, chief chemist of J. M. Huber, Inc., was guest speaker at the Technical School in Palmerton, Pa., on January 30 before a group studying rubber technology. He spoke on the development, manufacture and application of carbon black, illustrating his talk with specially prepared slides. GEORGE S. HASLAM, chief of the rubber section of the New Jersey Zinc Company, was chairman of the meeting, and other New Jersey Zinc officials who were present included E. J. FLYNN, plant superintendent; E. H. BUNCE, general manager of the technical department, and L. A. WILSON, chief of the testing department.

FRANK B. MACMILLIN has been elected president and general manager of the Hydraulic Press Manufacturing Company, Mount Gilead, O., succeeding WALTER G. TUCKER, who was advanced to the post of chairman of the board. HOWARD F. MACMILLIN was named vice-president and assistant general manager.

JOHN M. LLOYD, who for over 14 years had charge of publication work for the Society of Automotive Engineers, has become associated with Kellogg and Tree, industrial sales promotion counsellors, 300 Madison Avenue, New York City, as manager of their trade and consumer publicity department.

PAUL S. SHOAFF, operating manager of the Goodyear Rubber Plantation, arrived in Akron recently on a home leave after a three-year term in Sumatra. He will spend most of his home leave in Los Angeles and sail from San Francisco the latter part of March for another three years in Sumatra.

W. J. R. HAUSER JOINS HEVEATEX CORPORATION

W. J. R. Hauser, connected since its beginning with the Revertex Corporation of America and with the developments of Revertex and concentrated latex on the Continent and in England, has resigned as vice-president of that organization and has joined the Heveatex Corporation, Melrose, Mass., as its vice-president in charge of sales.

W. J. R. HAUSER

Mr. Hauser has opened an office for the Heveatex Corporation at 90 Broad Street, New York City, from which he will handle sales of rubber latex, latex concentrates and compounded latices. The telephone number of the New York office is BOwling Green 9-4833.

DR. W. K. LEWIS, head of the department of chemical engineering of the Massachusetts Institute of Technology, spoke before the Western Ontario Chemical Association at Sarnia, Ont., recently on "The Vulcanization of Rubber in Relation to the General Structure of Amorphous Materials."

WILLIAM O'NEIL, president of the General Tire & Rubber Company, addressed a mass meeting of Akron citizens at the local Y. M. C. A. on January 30 on plans for stimulating the building trades.

A. L. FREEDLANDER, vice-president of the Dayton Rubber Manufacturing Company, was guest speaker at a meeting of the Dayton Section of the American Society of Mechanical Engineers on January 30. He described "How Modern Rubber Engineering Has Kept Pace with Present Day Problems."

WILLIAM C. YOUNG, sales manager of the Goodyear-Zeppelin Corporation and head of the aeronautics department of the Goodyear Tire & Rubber Company, resigned those posts on January 1 to become a partner in the Carter-Jenkins Agency Company at Akron. He had been with the Goodyear organization since 1915 and has long been nationally known in aviation circles.

LEE PROFIT CONTINUES IN NOVEMBER AND DECEMBER

At the annual meeting of stockholders of the Lee Rubber & Tire Corporation, John J. Watson, president, stated that during the first two months of the fiscal year, November and December, the company earned a "nice" profit, whereas in the corresponding period of 1932 there was a net loss of $63,000. This showing was due to a "special buying situation" inasmuch as most tire and rubber companies lose money during that period of the year, according to Mr. Watson.

The company had previously reported a net profit of $260,607 for the year ended October 31, 1933. It was announced that the company has purchased 4,200 additional shares of its stock for its treasury since October 31, bringing total holdings to 45,235 shares.

Du Pont Earns $32,921,253

Net income of E. I. du Pont de Nemours & Company and wholly owned subsidiaries for the year ended December 31, 1933, were $32,921,253, equal to $3 a common share. This compares with 1932 profits of $19,769,305, or $1.82 a common share. Business volume in dollar sales was 24 per cent greater than in 1932, and the company was able to increase the number of its hourly wage earners by 13,000, or 75 per cent, over the low point of 1932.

Keokuk Buys Ott Equipment

Inner tube and tire manufacturing equipment of the Ott Rubber Company, Dubuque, Ia., in the hands of a receiver through actions by two banks, has been sold to the Keokuk Rubber Products Company, Keokuk, Ia., under a court order of Judge P. J. Nelson, for a bid price of $5,000. The latter firm will ship the machinery for installation at its plant in Keokuk. The Ott factory building, constructed especially for rubber goods manufacture, is still to be sold.

Standard Four Elects Officers

The Standard Four Tire Company, Keokuk, Ia., reelected its officers and directors at the annual stockholders meeting last month. Those reelected include Smith Hamill, president; W. C. Kimberly, vice-president; C. O. Frazier, secretary; and J. P. Mathias, treasurer. The company is striving to increase its tube production and sales to the 1,000,000-mark in 1934, according to W. E. Vance, general manager.

Ohio Rubber Payroll Up

More than 200 workers have been reemployed by the Ohio Rubber Company, Willoughby, O., in recent weeks, bringing the company's payroll back to the 900 mark, according to T. A. Guild, employment manager. Activity in the running board and mat departments was cited as the reason for the increased employment. The new boiler recently installed in the plant is now in operation and provides more than double the amount of power previously produced.

Financial News

Dayton Earns $183,239

The Dayton Rubber Manufacturing Company, Dayton, O., reports for the year ended October 31, 1933, a net profit of $183,239 after interest, taxes and other charges. This compares with a net loss of $26,842 in the preceding fiscal year. Total assets of $3,208,879 were reported.

Thermoid Note Extension

Holders of more than 75 per cent of the $2,684,000 6 per cent notes due February 1, 1934, have assented to the proposed plan for a three-year extension of the maturity date, according to Joseph O. Baur, treasurer-secretary of the Thermoid Company. Interest due February 1 is being paid to holders presenting notes for extension. The New York Curb Exchange has ruled that the company's notes shall be dealt in flat.

INDIA REORGANIZATION IS APPROVED BY COURT

The reorganization plan for the India Tire & Rubber Company, Mogadore, O., proposed by W. G. Klauss, former president, was approved by Common Pleas Judge Lionel S. Pardee on January 24 and is being put into effect. A new firm under the name of the India Tire Company has been formed to take over the assets of the old corporation. Mr. Klauss will act as president of the new concern.

Under the plan, unsecured creditors will receive 33⅓ per cent in cash, or 66⅔ per cent in three-year 6½ per cent notes, or 100 per cent in 6 per cent prior preference stock, callable at 120. Holders of the gold notes of the company, which have been outstanding in the amount of $800,000, are offered the same terms as the general creditors and it is stated that over 95 per cent have agreed to one plan or the other. A block of $464,080 of the notes which was held by British interests have received the cash settlement through means of a $155,000 loan obtained from the First National Bank of Massillon, O.

It is also stated that about 85 per cent of the general creditors have agreed to one plan or another. Preferred stockholders will receive share for share of a new issue of Class B 6 per cent preferred, while common stockholders will receive one share of common in the new company for each share held.

Increased production has already begun at the Mogadore plant, which has a capacity of about 2,500 casings daily, and the reorganization will save the jobs of 550 workers. India's financial difficulties came to a head nearly a year ago, and at one time it seemed likely that the firm might be taken over by the General Tire & Rubber Company. The state and federal receivership actions filed against the company have been dismissed.

GENERAL TIRE REPORTS NET INCOME OF $414,912

The report of the General Tire & Rubber Company and subsidiaries for the year ended November 30, 1933, shows net profit of $414,912 after interest, depreciation, federal taxes and special charges, including charges in connection with commitments on crude rubber amounting to $113,532 and $70,000 to provide for losses in closed banks. This is equivalent after allowing for regular annual dividend payments on the 6 per cent preferred stock to $2.67 a share on the common, and compares with net profit of $202,353, or 15 cents a common share, in the preceding year.

Gross sales for the fiscal year were $16,197,862. Net sales showed a reduction of 6 per cent in dollar volume but there was an increase in unit sales as compared with 1932. The company closed the year with $1,144,830 cash and without any indebtedness of any kind in the form of bonds, notes or bank obligations. The company's cash position was improved during the year to the extent of $835,809. Earned surplus was increased by the exact amount of the earnings and was reported as $3,744,322 as against $3,329,410 at the close of the preceding year.

Despite the improved showing, W. O'Neil, president, criticised the price cutting in the industry for the company's failure to report even larger profits. He stated, however, that every month since March has been profitable for the company and expressed a hope that the improvement would continue.

Directors and officers of the company were reelected.

O'SULLIVAN RUBBER CO. OFFERS COMMON STOCK

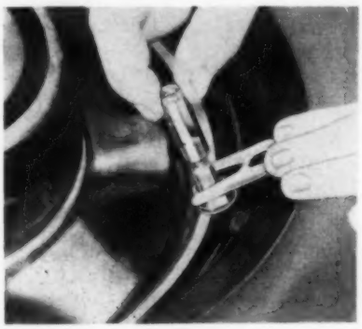
The O'Sullivan Rubber Company, Inc., maker of rubber heels, has issued 45,000 shares of stock, which will be offered to the public by Swart, Brent & Company, Inc., New York City. The offering will represent the first time securities of this corporation have been offered to the general public.

The corporation manufactures "O'Sullivan's Heels" and is the outgrowth of a business which was founded in 1896 by Humphrey O'Sullivan. The business has produced a profit from operations in every year since its inception, with the exception of nine months in 1932.

The offering is attracting attention in financial circles as one of the first public offerings of securities of a long-established industrial business involving an underwriting since the passage of the new Securities Act. The company has filed a 400-page, 80,000 word registration statement with the Federal Trade Commission. The statement is reported to have required over three months' preparation. The prospectus represents a summary of the registration statement and requires 26 printed pages.

New Rubber Goods

New Schrader Valve Assembly



A modern chrome finished valve combination has been introduced by A. Schrader's Son, Inc., Brooklyn, N. Y., under the name of the Ezemount Valve Assembly. While having adequate length, it allows for minimum protrusion after the mounting is completed. It permits the tightening of the hexagon nut from the outside of the rim, while the rim nut is omitted to allow for the assembly to pull back through the rim hole should the tire go flat. A Schrader Ezemount cap may also be used with a rim nut where preferred.

Rubber Trousers for Golf

The trousered woman golfer has definitely arrived in Britain, thanks to the introduction of mackintosh trousers. Miss A. de Montmorency, who played in the Women's Autumn Foursomes Tournament at Ranelagh recently wearing waterproof rubber trousers, had her example copied by her partner, Miss Newell, in the later stages of the tournament.

Raincoat manufacturers intend to cater for this new demand during the coming year, introducing stylishly cut mackintosh trousers that will enable women to play golf in all weather without fear.

The coming of the wet season has also brought about the usual demand for rubber raincoats, and young men who follow the styles are purchasing Prussian-collared fly-fronted models. Almost equally popular, however, is the double-breasted belted mackintosh cut on military lines and in very light shades.

Van Cleef Rub'r-Shim

Van Cleef Brothers, Chicago, Ill., has introduced a new product under the name of Rub'r-Shim which serves to stop rattles in auto bodies and in windows and doors of all kinds. It is a special rubber that compresses to less than one-half its normal thickness, thus the parts shimmed up are under constant pressure, preventing rattles and friction. No nails or tacks are required for application. It merely is stuck on and holds with a firm grip to any hard, flat or curved surface that is clean. Rub'r-Shim is put up in 3/8" width only and in three standard thicknesses of 5/32", 5/,16" and 7/16". For the consumer there are 10 foot rolls. Also supplied in unique shop size cartons of 50 continuous feet, there being no short wasteful lengths in either type of packing.

New Goodrich Batteries

Following its recent introduction of the Electro-Pak automobile storage battery for passenger cars, the B. F. Goodrich Company, Akron, O., now announces an extension to its line to include batteries made for practically every size truck, bus, fire truck, taxicab and tractor. Genuine hard rubber cases are used unless wood is desired. Separators are of the highest grade vertical grain Port Orford cedar, whose insulating strength is increased by perforated rubber sheets. This tends to retain the active material in the positive plates, and prolong battery life.

Klein-Kord Safety Strap

Mathias Klein & Sons, 3200 Belmont Avenue, Chicago, Ill., are now marketing a lineman's safety strap constructed of Klein-Kord, a rubberized fabric said to be stronger than leather. The material is made of four plies of heavy, close-woven, long fibre cotton, laid in rubber and vulcanized, producing a strong, flexible strap. The tensile strength per square inch of Klein-Kord is given as 5,660 pounds as against the usual specifications for fine harness leather of 3,500 pounds. It has a smooth, tough surface which resists damage from accidental cuts and its unaffected by contact with creosote, paint, acid or oil. Being rubberized it has a low conductivity, and being woven it possesses uniformity of thickness and strength.

NEW EXECUTIVES NAMED AT KELLY-SPRINGFIELD

Appointment of E. S. Burke as assistant general manager of the Kelly-Springfield Tire Company in full charge of all activities except manufacturing was announced late last month by W. H. Lalley, president of the company. Mr. Burke was formerly vice-president and general manager of the Fisk Rubber Company, with which he had been associated for 22 years.

The announcement was followed by the resignation of A. W. Barry as vice-president and general sales manager of Kelly-Springfield and, on February 6, by the resignation of six other executives, whose connection with the company has varied from four to 35 years. These included Louis Mueller, vice-president and manufacturing manager, who had been with the company since 1899; G. A. Biddle, assistant to the president; T. B. Byron, assistant general sales manager; W. G. Nolan, manager of truck and bus tire sales; J. E. Powers, eastern divisional sales manager; and E. J. Langham, advertising and sales promotion manager.

William S. Wolfe was named general factory manager by Mr. Lalley on February 10. He was formerly vice-president and factory manager of the Seiberling Rubber Company.

SUPER MOLD SUES ON RETREADING PATENTS

Super Mold Corporation, Lodi, Cal., manufacturers of the Lodi mold for retreading tires, recently brought two suits in the United States District Court at San Francisco, alleging infringement of its patent upon the method of adjusting tires to cause them to properly fit the retreading mold.

The controversy involves the right of the Super Mold Corporation to enjoin users of other types of molds from indulging in the use of variable rim widths in fitting tires into the mold where different tires are of the same side wall marked sizes but actually vary from that size. The correct fit of the tire in the mold is claimed to be essential to proper vulcanization and Super Mold Corporation contends that its patented methods control this feature.

The suits at San Francisco are against the Bear Tire Company of Oakland, and J. Robert Gibson of San Mateo. Executives of Super Mold Corporation announce that suits in other jurisdictions are also in contemplation.

Export to Europe

An American formerly European representative for an American rubber goods manufacturer now heads a group in Europe arranging distribution for American products. Our travellers are establishing important outlets for several American concerns. If you are not now exporting to Europe or if you are dissatisfied with your present volume of European sales we can probably help you. Write concerning your problem to Box 720, THE RUBBER AGE, 250 West 57th St., New York City.

OVERMAN TO INCREASE OUTPUT OF PNEUMATICS

The Overman Cushion Tire Company, Inc., has begun increased production of pneumatic tires, according to an announcement by Max Cyrus Overman, president. For this purpose its plant in Belleville, N. J. is being enlarged, and it is also planned to expand the company's merchandising activities.

New and larger executive offices are being opened in Rockefeller Plaza, New York City, and a campaign of newspaper and magazine advertising has been started. Organized in 1914, the firm's main business heretofore has been supplying heavy-duty cushion tires to commercial vehicle fleets.

MALAYAN GRANT TO AID IN PAVING OF TUNNEL

The Rubber Growers' Association announces that a substantial grant from the Federated Malay States Experimental and Propaganda Fund has been made toward the cost of the rubber paving to be laid in the Mersey vehicular tunnel. This fund was established in 1930, when the Federated Malay States government appropriated $2,500,000 for experimental research and propaganda work for the rubber industry.

"This further recognition of the efforts of the Association and its associated company, Rubber Roadways, Ltd., to extend the use of rubber is very gratifying," says an announcement by the Rubber Growers' Association.

1007-CAR FLEET SHOWS CUT IN TIRE COSTS

A graphic illustration of lowered tire costs is shown by the operating records of a fleet of 1,007 salesmen's cars and trucks of the General Foods Corporation. The firm's fleet includes 323 coupes, 467 sedan deliveries, and 217 half-ton panel deliveries, nearly all of which are on a 6-cylinder chassis, and cover a total of approximately 15,000,000 miles a year.

"Tire costs provide an interesting item in our records," says C. L. Jones, head of the General Foods automotive division. "In 1927 our tire costs averaged .8 cents a mile, including both new tires and repairs on old equipment. In 1929, improvement in tires and lowering in price were reflected in a tire cost of .4 cents a mile—just half what it had been two years before. Then in 1391 our tire mileage cost dropped to .3 cents. For the first nine months of 1933, our tire mileage cost was comfortably under .2 cents, although for the full year of 1933 we expect it to average about .2 cents a mile."

U. S. Cotton Mill Busy

The Shelbyville Mills, Shelbyville, Tenn., which was purchased late last year by the United States Rubber Company, are now operating on a full-time day and night schedule, employing three shifts of operatives. The payroll now comprises 400 operatives.

Rubber Technology Handbook

Edited by Dr. E. A. Hauser, a new manual of rubber technology under the title of *Handbuch der Gesamten Kautschuktechnologie* will be published early this spring by the Union Deutsche Verlagsgesellschaft, Berlin, Germany. It will include contributions on various phases of rubber technology by more than 30 well known rubber chemists and engineers.

Waste Materials Year Book

The National Association of Waste Material Dealers, Inc., will issue at an early date the 1934 edition of its Year Book and Code Guide. This volume will cover waste material commodity classifications, trade customs, foreign trade information, association membership lists, and the code of the waste material trade and all related codes.

Vanderbilt News Discusses Tubes

Special compounding is needed today to meet the severe service conditions to which automobile inner tubes are subjected. Recommendations for tube compounds and studies of tests made with such compounds form the sole subject for the January-February, 1934, issue of the *Vanderbilt News*, published by the R. T. Vanderbilt Company.

DUNLOP INAUGURATES BULK LATEX SHIPMENTS

First bulk shipments of liquid rubber latex from the plantations of the Dunlop Rubber Company arrived at Liverpool on January 18. The Blue Funnel liner Eumaeus discharged 25,000 gallons of latex into two huge storage tanks erected by Dunlop near Gladstone Dock, from which the latex was taken in small tanks, each holding 500 gallons, to Dunlop's works at Walton, Liverpool.

Rubber latex had previously been brought from Malay to Liverpool in small steel drums, but Dunlop arranged with the Blue Funnel line to equip five of their vessels with two tanks, each holding 12,500 gallons of latex, which will permit monthly importations from Singapore. The new method of carrying and discharging latex is said to be more economical and expeditious, and to give better results as regards the purity of the rubber.

NEW TYPE RAILCAR DEMONSTRATED RECENTLY

A new type railcar, built by Chrysler for the Fairbanks-Morse Co., and equipped with Goodyear rail tires, was demonstrated late last month on the tracks of the Chicago and Northwestern R. R. The name given this railcar is the "Railmobile". It is practically a road bus adapted to rail use with as few changes as possible.

The Railmobile unit consisted of a coach and trailer, the coach seating 14 passengers and a crew of two, while the trailer has a freight capacity of two tons. It has a 65 h.p. motor, the same as in the 1½ ton Dodge truck, with a top speed of 60 miles. The rail tire developed by Goodyear has an aluminum safety ring inside which prevents the wheel from dropping more than 5/8 of an inch if a puncture occurs. In a recent test one of the tires was purposely blown at high speed and the car was brought to a stop without mishap.

Goodrich Subsidiaries Confer

The Hood Tire Corporation, the Diamond Rubber Company, Inc., the Miller Rubber Products Company, Inc., and the Brunswick Tire Corporation, all subsidiary companies of the B. F. Goodrich Company, held a general sales conference at the Mayflower Hotel, Akron, last month. The conference included all eastern sales divisions as well as the Pacific coast division and was conducted by H. E. Keller, vice-president and general manager of the Goodrich associated tire lines.

Golf Ball Imports Lower

During 1933 the United States imported 1,068,440 golf balls, worth $255,250, as compared with 1932 imports of 1,451,445 balls with a value of $336,027. All except 624 balls were imported from the United Kingdom.

New Factory in India

The Travancore government has sanctioned the establishment of a rubber factory in that province of southern India. J. Helen of Karachi has been asked to submit a report on the starting of the concern.

Rubber Interests Unite

The Rubber Growers Association and the Planters Association of Malaya have formed the United Planting Association of Malaya. It is believed that this step has been taken in order to have a central body to represent British rubber interests in any restriction negotiations.

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MARKETS

RUBBER—COTTON AND FABRICS—CHEMICALS

NEW YORK, FEBRUARY 9, 1934

Crude Rubber

THE average price of spot rubber on the outside New York market jumped to 9.40 cents in January compared to 8.87 for December. The high for the month was 10⅜ on January 29, since which day quotations have fluctuated between 10 and 10⅝ cents. The apparent difficulties which the British and Dutch restriction committees are meeting have had their bullish effects on the market as indicated by the jump of 30 points on Feb. 5 on the Exchange when an interpretation favorable to restriction was put on the remarks of the Minister of the Dutch Colonies when he stated that he expected his government to make a decision shortly on rubber restriction schemes under consideration. Denials of any immediate agreement however caused a drop in the market, which closed at 10 5/16 on the outside and 10.25 on the exchange for spot. Quotations follow:

Plantations—

Ribbed Smoked Sheets—			
Spot	—	@	.10 5/16
February	—	@	.10⅜
Apr.-June	—	@	.10⅜
First Latex, crepe spot	—	@	.11⅞
Amber Crepe, No. 2	—	@	.08¼
Amber Crepe, No. 3	—	@	.08⅛
Amber Crepe, No. 4	—	@	.08
Brown Crepe, clean thin	—	@	.08¼
Brown Crepe, rolled	—	@	.06¾

Latex—

Liquid Latex, per gal.	.72	@	—

Paras—

Up River, fine	—	@	.09¼
Acre Bolivian, fine	—	@	.09¾

Balata—

Block, Ciudad	—	@	.28

LONDON MARKET

Standard Smoked Sheets—Buyers—Feb. 8			
February	—	@	4 25/32d
Apr.-June	—	@	4 7/8d

SINGAPORE MARKET

Standard Smoked Sheets—Sellers—Feb. 8			
February	—	@	4 5/16d
Apr.-June	—	@	4 11/16d

Reclaimed Rubber

Although there have been no changes in quotations of reclaims, the prices quoted are only nominal in view of the constantly changing conditions in the crude industry. Talk of agreement on restriction and subsequent denials is causing an uneasy crude rubber market which is reflected in reclaims. Reclaimers are optimistic of a larger volume in 1934 at levels which will permit some profit. Current quotations follow:

High Tensile

High Tensile Red.....lb.	.06½	@	.06¾

Shoe

Unwashed .....lb.	.06½	@	.06¾

Tube

No. 1 (Floating).....lb.	.11	@	—
No. 2 (Compounded).....lb.	.06¼	@	.06½

Tires

Black .....lb.	.04¾	@	.05
Black, selected tires.....lb.	.05	@	.05¼
Dark Gray .....lb.	.05¾	@	.06
White .....lb.	.07¼	@	.07½
Truck, Heavy Gravity.....lb.	.05¼	@	.05½
Truck, Light Gravity.....lb.	.05¾	@	.06

Miscellaneous

Mechanical blends .....lb.	.04	@	.04¼

Scrap Rubber

Prices of scrap rubber are showing an upward tendency in keeping with quotations of crude. Several grades of scrap, as solid tires, arctics and inner tubes are fractionally higher. Demand is light at the present with supplies of most grades adequate. Quotations follow:

(Prices to Consumers)

Auto tire peelings.....ton	19.00	@	21.00
Mixed auto .....ton	10.00	@	11.00
Clean solid truck tires.....ton	33.00	@	35.50
Boots and shoes.....ton	25.00	@	27.00
Arctics, untrimmed .....ton	20.00	@	22.00
Inner tubes, No. 1.....lb.	.05¼	@	.05½
Inner tubes, No. 2.....lb.	.02¾	@	.03
Inner tubes, Red.....lb.	.02¾	@	.02⅞

Cotton

Cotton has made a spectacular rise in sympathy with other staples, with the January average for N. Y. spot reaching 11.25 cents compared to 10.17 in December. The month ended at 11.75 with 12.45 quoted on February 8. The market has been influenced largely by the expectation of favorable action on the Bankhead bill to restrict 1934 ginnings and the new low dollar of 59 cents. Buying has been active recently from consumers and commission houses on the prospects of production control. The large government holdings of cotton are expected to figure in price movements, it being figured that cotton may be released from the pool when prices reach 15 cents. Quotations on the N. Y. Cotton Exchange for Middling Uplands follow:

	Jan. 9	Feb. 9		
	Close	High	Low	Close
March	10.76	12.12	11.78	12.11
May	10.92	12.27	11.93	12.27
July	....	12.44	12.08	12.44

Tire Fabrics

(Prices Net at the Mill—Process Tax Included)

Peeler, carded, 23/4/3.....lb.	.43½	@	—
Peeler, carded, 23/5/3.....lb.	.42½	@	—
Peeler, carded, 13/3/3.....lb.	.39½	@	—
Peeler, carded, 15/3/3.....lb.	.40½	@	—
Egyptian, carded, 23/5/3.....lb.	.51½	@	.54¼
Egyptian, combed, 23/5/3.....lb.	.53½	@	.55¼

CHAFERS

Carded, America, 1 1/16".....lb.	.39	@	.41
Carded, American, 1".....lb.	.33½	@	.34

LENO BREAKER

Carded, American, 1 1/16".....lb.	.39	@	.41
Carded, American, 1".....lb.	.33½	@	.34

Sheetings

Count	Width	Weight			
48x40	36 in.	5.50 .....lb.	—	@	.05⅞
40x40	36 in.	6.15 .....lb.	—	@	.05¼
40x36	36 in.	6.50 .....lb.	—	@	.05⅛
48x48	40 in.	2.50 .....lb.	.10¾	@	.11
48x48	40 in.	2.85 .....lb.	.09½	@	.09¾
64x68	40 in.	3.15 .....lb.	—	@	.10⅜
56x60	40 in.	3.60 .....lb.	—	@	.09⅜
48x44	40 in.	3.75 .....lb.	—	@	.07¾
44x40	40 in.	4.25 .....lb.	—	@	.06⅞

Ducks

Enameling .....lb.	.31	@	.32
Belting and Hose.....lb.	.36	@	—
Single filling, A grade.....lb.	.15¾	@	.16½
Double filling .....lb.	.16¾	@	.17¾

Closing Rubber Prices on New York Commodity Exchange, Inc.

No. 1 Standard Contract of 10 Tons

FROM JANUARY 10 TO FEBRUARY 8

Date		Spot	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Sales
Jan.	10	8.86	8.82	8.94	9.06	9.17	9.28	9.39	9.51	9.61	9.73	9.82	9.92	10.02	——	56
	11	8.85	8.85	8.95	9.06	9.17	9.30	9.40	9.51	9.61	9.72	9.82	9.92	10.00	——	78
	12	8.85	8.86	8.95	9.04	9.14	9.25	9.38	9.51	9.61	9.72	9.82	9.92	10.02	——	136
	13	8.91	8.92	9.01	9.11	9.22	9.34	9.45	9.56	9.66	9.77	9.87	9.97	10.07	——	37
	14															
	15	9.08	8.96	9.05	9.14	9.26	9.38	9.49	9.61	9.73	9.85	9.95	10.05	10.15	——	767
	16	8.97	8.91	9.01	9.12	9.22	9.33	9.45	9.57	9.69	9.81	9.90	10.00	10.10	——	204
	17	8.80	8.80	8.85	8.90	9.01	9.12	9.24	9.36	9.45	9.55	9.65	9.75	9.85	——	450
	18	9.37	9.35	9.42	9.48	9.61	9.76	9.86	9.97	10.08	10.19	10.29	10.39	10.49	——	937
	19	9.37	9.37	9.43	9.49	9.61	9.74	9.85	9.96	10.08	10.20	10.25	10.35	10.45	——	456
	20	9.76	9.74	9.81	9.89	10.02	10.16	10.27	10.39	10.49	10.60	10.70	10.80	10.90	——	542
	21															
	22	9.50	9.49	9.56	9.64	9.77	9.90	10.02	10.15	10.27	10.41	10.40	10.52	10.65	——	501
	23	9.50	9.47	9.53	9.60	9.72	9.85	9.96	10.09	10.22	10.36	10.46	10.56	10.66	——	243
	24	9.68	9.65	9.72	9.79	9.92	10.06	10.19	10.32	10.43	10.55	10.66	10.76	10.87	——	581
	25	9.79	9.75	9.82	9.90	10.04	10.17	10.29	10.40	10.52	10.64	10.74	10.84	10.94	——	413
	26	10.13	10.10	10.16	10.24	10.36	10.51	10.61	10.72	10.85	10.97	11.07	11.17	11.27	——	816
	27	9.94	9.75	9.81	9.89	10.03	10.19	10.31	10.45	10.56	10.70	10.80	10.90	11.00	——	186
	28															
	29	10.37	10.26	10.32	10.42	10.56	10.71	10.85	11.00	11.11	11.23	11.32	11.42	11.52	——	954
	30	9.90	9.81	9.87	10.02	10.16	10.32	10.46	10.62	10.74	10.87	10.97	11.07	11.17	——	765
	31	9.87	——	9.80	9.95	10.11	10.30	10.39	10.52	10.63	10.75	10.85	10.95	11.05	——	417
Feb.	1	9.94	— —	9.85	10.00	10.13	10.27	10.41	10.57	10.68	10.79	10.89	10.99	11.09	11.19	461
	2	9.82	— —	9.80	9.95	10.08	10.22	10.36	10.50	10.61	10.73	10.83	10.93	11.03	11.13	220
	3	9.97	——	9.95	10.01	10.16	10.33	10.45	10.59	10.70	10.82	10.92	11.02	11.12	11.22	208
	4															
	5	10.08	——	10.08	10.20	10.35	10.50	10.64	10.78	10.88	10.98	11.09	11.22	11.36	11.45	632
	6	10.50	——	10.42	10.57	10.71	10.86	11.00	11.16	11.27	11.39	11.50	11.61	11.72	11.83	898
	7	10.25	——	10.19	10.34	10.49	10.64	10.75	10.87	10.99	11.11	11.22	11.33	11.44	11.55	727
	8	10.25	——	10.15	10.30	10.42	10.55	10.69	10.83	10.96	11.09	11.20	11.31	11.42	11.53	560

Rubber CHEMICAL Markets

NEW YORK, February 9, 1934

ACCELERATORS

Organic			
A-1	lb.	.21 @	.25
A-5-10	lb.	.33 @	.36
A-7	lb.	.53 @	.65
A-11	lb.	.60 @	.75
A-16	lb.	.55 @	.65
A-19	lb.	.56 @	.75
A-32	lb.	.70 @	.80
Aldehyde ammonia, crystals	lb.	.65 @	.67
Altax	lb.		
Captax	lb.		
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.46 @	.47
Diphenylguanidine	lb.	.36 @	.37
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde aniline	lb.	.37½ @	.42
Guantal	lb.	.42 @	.51
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.37 @	—
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.36 @	.37
Monex	lb.	3.25 @	—
Oxynone	lb.	.68 @	.80
Phenex	lb.	.50 @	.55
Pipsol X	lb.	3.55 @	4.00
R & H 40	lb.	.40 @	.41
R & H 50	lb.	.40 @	.41
R-2	lb.	1.55 @	1.90
R-2 Base	lb.	4.55 @	5.00
Safex	lb.	1.20 @	1.25
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.		
No. 2	lb.		
Thiocarbanilid, drums	lb.	.20 @	.23
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.60
Tuads	lb.		
Ureka	lb.	.62 @	1.00
Ureka C	lb.	.58 @	.69
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Z-88-P	lb.	.48 @	.60
Zimate	lb.		
Inorganic			
Litharge, domestic	lb.	.06¾ @	—
Magnesia, calcined, heavy	cwt.	4.00 @	4.50

COLORS

Blacks (See Compounding Materials)

Blues			
Prussian	lb.	.36 @	.37
Ultramarine	lb.	.06 @	.10
Browns			
Sienna, Italian	lb.	.04 @	.08
Umber, Turkey	lb.	.04 @	.06
Greens			
Chrome, light	lb.	.23 @	.26
medium	lb.	.26 @	.28
dark	lb.	.28 @	.33
Chromium Oxide, bbl.	lb.	.23 @	.27
Reds			
Antimony			
crimson, 15/7	lb.	.45 @	—
sulfur, free	lb.	.48 @	.52
Indian English	lb.	.09 @	.10
Domestic (Maroon)	lb.	.11 @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red, f.o.b. Easton	lb.	.09¼ @	—
Whites			
Cryptone CB, No. 21	lb.	.06 @	.06¼
Cryptone, No. 19	lb.	.06 @	.06¼
Lithopone, Albalith	lb.	.04½ @	.04¾
Lithopone, Azolith	lb.	.04½ @	.04¾
Titanium oxide	lb.	.17 @	.19
Titanox B	lb.	.06 @	.06½
Titanox C	lb.	.06 @	.06½
XX Zinc Sulphide, bbls.	lb.	.11 @	.11¾
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.05¾ @	.06
ZZ (leaded)	lb.	.05½ @	.05¾
Horsehead Lead Free Brand:			
Selected	lb.	.05¾ @	.06
Special	lb.	.05¾ @	.06
XX Red	lb.	.05¾ @	.06
XX	lb.	.05¾ @	.06
XX Green	lb.	.05¾ @	.06
Leaded Brand, Standard	lb.	.05½ @	.05¾
Sterling	lb.	.05½ @	.05¾
Superior	lb.	.05½ @	.05¾
Lehigh	lb.	.05¼ @	.05½
U. S. P., bbls.	lb.	— @	.12¾
Kadox, black label	lb.	.09⅜ @	.09⅝
Blue label	lb.	.08⅜ @	.08⅝
Red label	lb.	.07 @	.07¾
St. Joe, black label	lb.	.05¾ @	.06
green label	lb.	.05¾ @	.06
red label	lb.	.05¾ @	.06
Zinc Oxide—French Process			
Anaconda, lead free	lb.	.05¾ @	.06
Anaconda, selected lead free	lb.	.06¼ @	.06½
Florence White seal, bbls.	lb.	— @	.10⅜
Green seal	lb.	.09⅜ @	.09⅝
Red seal	lb.	.08⅜ @	.08⅝
Yellows			
Chrome	lb.	.16 @	.16½
Ocher, dom. med.	lb.	.01½ @	.02

BLACKS

Arrow "Aerfloted"	lb.	.0445 @	.0535
Arrow "Aerfloted" Specification	lb.	.0445 @	.0535
Bone, powdered	lb.	.05½ @	.12½
Carbon, compressed	lb.	.02¾ @	.07
uncompressed	lb.	.02¾ @	.07
"Certified," Cabot	lb.	.0445 @	.0535
Spherons	lb.	.02¾ @	—
"Disperso"	lb.	.0445 @	.0535
Drop, bbls.	lb.	.05½ @	.14
"Excello," compressed	lb.	.0445 @	.0535
"Fumonex"	lb.	.03 @	.07
"Gastex"	lb.	.03 @	.07
Lampblack	lb.	.06 @	.08
"Micronex"	lb.	.0445 @	.0535
"Supreme"	lb.	.0445 @	.0535
Thermatomic—"P 33"	lb.	— @	—
"Thermax"	lb.	— @	—
United "Dixie" & "Cosmos"	lb.	.0445 @	.0535

COMPOUNDING MATERIALS

Aluminum Flake	ton.	21.85	@24.50
Ammonia carbonate, lump	lb.	.10½ @	.12
Asbestine	ton	14.00 @	—
Barium carbonate (98-100%)	ton	56.50	@61.50
Barium Dust	lb.	.05 @	.06
Barytes southern off-color	ton	10.00	@18.00
Western prime white	ton	23.00 @	—
Basofor	lb.	.04½ @	—
Bentonite	lb.	.02 @	.03
Blanc fixe dry f.o.b. works	ton	70.00	@75.00
Carrara filler	lb.	.01¾ @	.02
Catalpo (fact.)	lb.	.02 @	—
Chalk, precipitated			
Suprex white, extra lt.	ton	60.00	@75.00
heavy	ton	45.00	@55.00
Clay, Kaolin, domestic	ton	6.00	@ 7.00
Aerfloted, Suprex	ton	6.50	@ 8.00
Congaree	ton	9.00 @	—
Dark Blue Ridge	ton		
Dixie	ton		
Langford	ton		
Lexington	ton	10.00	@22.00
Par	ton		
Tensulite		15.00 @	—
Cotton Flock	lb.	.10½ @	.18
Glues, extra white	lb.	.15 @	.22
medium white	lb.	.12 @	.14
Kalite No. 1	ton	30.00	@55.00
Kalite No. 3	ton	40.00	@65.00
Magnesia, carbonate	lb.	.06 @	.06¾
Mica	lb.	.04 @	—
Rottonstone (powdered)	ton	23.50	@28.00
Soapstone, powdered	ton	16.00	@18.00
Starch, powdered	cwt.	2.50 @	2.60
Talc, domestic	ton	12.00	@15.00
Pyrax A	ton		
Whiting, commercial	cwt.	.85 @	1.10
English cliffstone	cwt.	1.50 @	1.70
Sussex	ton		
Witco	ton	20.00 @	—
Zinc Carbonate	lb.	.10½ @	—
Zinc Stearate	lb.	.23 @	—

MINERAL RUBBER

Genasco (factory)	ton	30.00	@32.00
Granulated M. R.	ton		
Hard Hydrocarbon	ton		
Parmr, solid	ton	23.00	@28.00
Pioneer, MR, solid	ton	40.00	@42.00
Pioneer-granulated	ton	50.00	@52.00

SPECIALTIES

Aromatics—Rodo	lb.		
Para-Dors No. 5145	lb.	2.00 @	—
Sunproof	lb.	.35 @	.37½
Sponge Paste	lb.	— @	.80
Tonox	lb.	.56 @	.60

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulfuric, 66 degrees	cwt.	1.55 @	1.80
Tartaric, crystals	lb.	.23½ @	—
Acids, Fatty			
Laurex	lb.	.15 @	.16
Stearex	lb.	.08 @	.12
Stearic, double pressed	lb.	.08 @	.12
Alkalies			
Caustic Soda, 76%	cwt.	3.66 @	—
Soda Ash, 58% C.L.	cwt.	2.52 @	—
Oils			
Corn, refined, bbls.	lb.	— @	.06¾
Cottonseed, crude	gal.	— @	.04
Cycline Oil	gal.	.15 @	.28
Degras (c.l. 100 bbls.)	lb.	.02¾ @	—
Less c.l. (10-25 bbls.)	lb.	.03 @	—
Lots less than 10 bbls.	lb.	.03¾ @	—
Fluxrite	lb.	.05½ @	.06½
Palm Lagos	lb.	.04¾ @	—
Niger	lb.	.02¾ @	.03
Para-Flux	gal.	.17 @	—
Petrolatum, light	lb.	.02½ @	—
Pigmentaroil	gal.	.13 @	.18
Pine, steam distilled	gal.	.59 @	.61
destructively distilled	gal.	.56 @	.58
Tackol	lb.	.08½ @	.18
Witco Palm Oil	lb.	.07½ @	—
Witco Softener (f.o.b. wks.)	lb.	.02 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.05 @	.06
coal tar	gal.	.05½ @	.06
pine, 200 lb. gr. wt.	bbl.	6.00 @	—
Rosin, grade K, 290 lb.	bbl.	5.50 @	—
Pigmentar	gal.	.13 @	.18
Tar Retort, 50 gal.	bbl.	9.50	@10.00
Solvents			
Acetone, pure	lb.	.10 @	—
Alcohol, denatured, No. 1 bbls.	gal.	.30½ @	.41½
Benzol, 90%	gal.	— @	.27
Carbon, bisulfide	lb.	.05 @	.06
Carbon, tetrachloride	lb.	.05¼ @	.06
Dichlorethylene	lb.	.29 @	—
Dipentene	gal.	.31 @	.41
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10½
Ethylene dichloride	lb.	.05½ @	.06½
Gasoline, steel bbls.	gal.	.16 @	—
Naphtha, solvent	gal.	.26 @	.31
Rub-Sol (f.o.b. Okla.)	gal.	.09 @	—
Turpentine, spirits	gal.	.55 @	—
wood	gal.	.50 @	—
destructively distilled	gal.	.45 @	—
Waxes			
Beeswax, white	lb.	.30 @	.32
Carnauba	lb.	.25 @	.26
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.05 @	.06
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Paraffin (c.l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.02¾ @	.03½
White crude scale 124/126	lb.	.02 @	.02½
Refined, 125/127, 138/140	lb.	.03 @	.07

ANTI-OXIDANTS

AgeRite, Gel	lb.		
Powder	lb.		
Resin	lb.		
White	lb.		
Albasan	lb.	.70 @	.75
Antox	lb.		
B-L-E	lb.	.57 @	.60
Flectol-A and Flectol-B	lb.	.54 @	.62
Neozone	lb.		
Oxynone	lb.	.68 @	.80
Resistox	lb.	.52 @	.65
Retardex	lb.	.35 @	.40
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.55 @	.60

MOLD LUBRICANTS

Dipex	lb.	.06 @	.08
Sericite, f.o.b. N. Y.	ton	65.00 @	—
Zip	lb.	— @	—

SUBSTITUTES

Amberex	lb.	.13¾ @	—
Black	lb.	.06 @	.08
White	lb.	.07½ @	.12
Brown	lb.	.06½ @	.11

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03½ @	.04
Sulfur flour,			
Refined, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags)	cwt.	1.75 @	2.10
Telloy	lb.		
Vandex	lb.		

Crude Rubber
Latex and Guayule
Reclaimed Rubber
Tires and Tubes

STATISTICS OF THE INDUSTRY

Rim Production
Automobiles
Gasoline
Cotton Prices

U. S. Imports and Exports of Crude Rubber

YEARS	Gross Imports: Long Tons	Gross Imports: Total Declared Value	Gross Imports: Average Declared Value per pound Cents	Re-exports: Long Tons	Re-exports: Total Declared Value	Re-exports: Average Declared Value per pound Cents	Net Imports: Long Tons
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1929	560,084	239,178,783	19.15	36,485	16,868,733	20.64	523,599
1930	482,082	139,134,330	12.89	30,205	9,316,205	13.77	451,877
1931	497,138	72,918,949	6.54	25,595	4,255,472	7.42	471,543
1932	409,584	31,936,459	3.47	20,929	2,015,612	4.30	388,655
1933	407,817	44,034,064	4.82	20,537	2,601,352	5.65	427,280
1931:							
Nov.	43,345	4,742,218	4.72	1,403	198,284	6.31	43,345
Dec.	53,536	5,610,120	4.68	2,462	326,382	5.91	51,070
1932:							
Jan.	33,221	3,387,505	4.55	1,524	185,466	5.43	31,697
Feb.	27,959	2,690,250	4.29	1,915	222,584	5.19	26,044
Mar.	45,197	4,251,801	4.19	2,227	240,128	4.84	42,970
April	37,903	3,181,343	3.74	2,128	196,934	4.53	35,775
May	34,182	2,798,914	3.71	1,505	144,561	4.30	32,677
June	40,808	2,647,085	2.89	1,981	134,336	3.02	39,136
July	32,306	2,102,915	2.91	2,030	179,699	3.95	30,276
August	33,449	2,027,045	2.71	1,339	128,952	4.29	32,110
Sept.	28,956	1,774,403	2.73	2,388	241,960	4.54	26,568
Oct.	35,096	2,436,522	3.10	1,059	98,022	4.13	34,037
Nov.	28,908	2,263,469	3.48	1,745	158,618	4.06	27,163
Dec.	31,384	2,360,061	3.34	770	66,165	3.98	30,614
1933:							
Jan.	29,822	2,213,828	3.03	1,403	109,916	3.49	28,419
Feb.	22,603	1,554,086	3.12	1,244	102,129	3.73	21,359
Mar.	27,936	1,867,657	2.98	1,127	86,216	3.42	26,809
April	20,240	1,291,136	2.85	798	70,111	3.92	19,442
May	26,002	1,694,963	2.93	1,842	189,451	4.59	24,894
June	22,900	1,780,495	3.47	1,276	156,168	5.46	21,624
July	44,625	4,293,111	4.29	1,419	219,945	6.92	43,206
August	44,257	5,391,709	5.44	2,205	302,132	6.12	42,052
Sept.	44,912	6,110,956	6.07	2,369	335,798	8.89	42,543
Oct.	44,474	6,115,330	6.14	2,669	397,167	6.64	41,805
Nov.	40,582	5,850,714	6.44	2,188	333,631	6.81	38,394
Dec.	39,461	5,869,556	6.75	1,888	293,690	6.94	37,573

United States Imports of Guayule, Balata, Jelutong, Liquid Latex

(All Quantities in Long Tons)

	Guayule: Tons	Guayule: Dollars	Balata: Tons	Balata: Dollars	Jelutong: Tons	Jelutong: Dollars	Liquid Latex (1): Tons	Liquid Latex (1): Dollars
1924	1,356	536,392	464	568,456	6,165	1,237,100	2,157	864,059
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	3,853	3,537,810
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	3,388	4,680,386
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,116	876,077
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	4,167	2,185,579
1929	1,231	545,175	728	566,964	8,203	2,458,136	3,728	1,787,997
1930	1,096	347,388	501	422,684	5,907	1,403,244	4,449	1,506,804
1931	—	—	1,208	411,692	5,777	1,019,010	4,650	884,355
1932	—	—	708	147,403	4,607	616,596	5,085	601,999
1933	—	—	1,658	2,261,869	5,989	944,895	11,085	1,833,671
1933:								
Jan.	—	—	33	7,815	357	40,586	841	100,900
Feb.	—	—	12	2,923	391	52,171	367	46,037
Mar.	—	—	45	11,963	437	56,262	539	55,731
April	—	—	7	2,054	210	26,856	794	80,794
May	—	—	35	9,869	463	55,560	734	71,008
June	—	—	759	1,514,296	466	61,229	604	66,827
July	—	—	238	76,141	638	79,049	618	85,636
Aug.	—	—	272	527,147	390	55,509	1,156	196,138
Sept.	—	—	65	30,738	761	149,296	1,343	267,516
Oct.	—	—	119	47,663	542	99,249	1,561	310,531
Nov.	—	—	31	11,252	626	125,160	1,239	282,065
Dec.	—	—	42	20,008	708	143,868	1,290	270,533

(1) Weight given in pounds of dry rubber contained in latex.

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1926	1927	1928	1929	1930	1931	1932	1933
Jan.	32,196	31,518	34,403	43,002	36,194	28,557	29,648	21,661
Feb.	31,136	30,137	33,702	41,594	33,302	28,797	31,821	21,638
Mar.	32,936	36,141	35,688	44,736	35,540	32,788	29,505	18,047
Apr.	32,696	35,871	32,772	47,521	39,686	33,321	27,515	26,226
May	29,364	34,592	37,333	49,233	39,386	37,817	30,957	44,580
June	28,598	33,801	37,676	43,227	34,195	37,916	41,475	51,326
July	27,577	29,219	37,407	41,526	29,508	31,397	29,976	50,184
Aug.	34,533	33,460	42,927	38,274	30,850	27,586	23,721	44,939
Sept.	32,904	27,214	39,882	34,707	25,515	23,638	23,847	35,686
Oct.	29,936	26,790	40,857	34,800	27,516	22,277	22,286	31,906
Nov.	28,080	26,792	37,461	27,659	23,691	22,943	23,231	29,162
Dec.	26,293	25,492	31,232	25,531	21,687	21,409	18,015	29,087
Tot.	366,149	371,027	441,340	469,804	375,980	348,986	332,000	405,689

Figures on Quarterly Basis

Quarter	1926	1927	1928	1929	1930	1931	1932	1933
Jan./Mar.	94,301	99,216	103,558	128,565	101,610	89,652	85,309	64,211
Apr./June	87,109	103,242	103,500	139,292	112,229	107,755	92,643	121,445
July/Sept.	93,793	89,210	117,573	113,746	85,261	83,632	72,523	—
Oct./Dec.	83,212	80,860	117,597	84,872	72,020	65,645	64,145	—
Totals	358,415	372,528	442,227	466,475	371,120	346,684	314,620	—

Note—The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Reclaimed Rubber in the United States

(All Quantities in Long Tons)

Year	Production	Consumption: Tons	Consumption: % to Crude	Stocks*
1923	74,766	69,534	22.7	.....
1924	80,079	76,072	22.4	.....
1925	132,930	137,105	35.6	13,203
1926	180,582	164,500	45.9	23,213
1927	189,144	178,471	47.6	24,980
1932:				
Jan.	8,660	8,971	30.3	22,682
Feb.	8,638	8,856	27.9	22,617
Mar.	8,521	7,887	26.7	23,910
Apr.	5,614	5,987	21.4	23,156
May	5,078	6,534	21.1	20,320
June	5,986	7,569	18.3	18,148
1933:				
Jan.	5,301	4,811	21.0	16,262
Feb.	4,578	4,363	20.2	16,570
Mar.	3,847	3,454	19.1	15,496
Apr.	4,617	4,407	16.8	14,370
May	8,366	7,770	17.4	13,734
June	10,591	9,674	18.8	13,231

Year	Production	Consumption: Tons	Consumption: % to Crude	Stocks*
1928	208,516	223,000	50.4	24,785
1929	218,954	226,588	48.4	27,464
1930	157,967	153,497	40.8	22,000
1931	133,351	124,126	33.9	19,257
1932	75,608	77,504	23.4	16,354
July	5,475	5,524	18.4	17,570
Aug.	3,299	4,717	19.9	15,737
Sept.	5,364	5,636	23.6	15,124
Oct.	6,675	5,915	26.5	14,965
Nov.	6,612	5,636	24.2	15,111
Dec.	5,686	4,272	23.7	16,354
July	12,049	10,317	20.6	14,108
Aug.	11,708	9,446	21.0	15,037
Sept.	10,435	7,862	22.0	15,869
Oct.	9,466	7,212	22.6	17,748
Nov.	9,063	6,335	21.7	19,170
Dec.	9,539	5,951	20.5	20,746

* Stocks on hand at the end of month or year.
(Rubber Manufacturers' Association figures raised to 100%)

U. S. Consumption of Gasoline

(In Thousands of Barrels of 42 Gallons)

	1931	1932	1933
January	26,844	26,038	26,510
February ..	26,133	25,378	23,312
March	31,037	29,597	28,227
April	33,400	31,234	30,176
May	35,716	32,016	33,999
June	38,375	39,489	37,710
July	39,459	30,929	34,458
August	39,459	35,706	37,426
September .	36,670	33,828	34,303
October ...	35,051	32,680	32,973
November ..	30,640	29,895	30,262
December ..	30,529	27,110	28,787
Total	403,418	373,900	378,143

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4*	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1932																																
January	—	4 5/16	—	4 5/16	4 1/2	4 3/16	4 5/16	4 1/16	4 1/16	—	4 5/16	4 5/16	4 1/16	4 1/16	4 5/16	4 5/16	—	4 5/16	4 5/16	4 5/16	4 5/16	—	—	—	—	3 7/16	4 1/16	4 1/16	4 1/16	—	—	4 1/16
February	4 3/16	4 1/16	4 1/16	4 1/16	4 1/2	4 3/16	—	4 1/16	4 1/16	4 1/16	4 5/16	4 5/16	4 1/16	4 1/16	4 5/16	4 5/16	4 1/16	4 1/16	4 1/16	4	—	3 15/16	3 15/16	4 1/16	3 15/16	4 1/16	3 15/16	4 1/16	3 15/16	3 15/16	3 15/16	—	4 1/16
March	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	4	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16
April	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
May	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	4	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16
June	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	4	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16
July	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	4	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16
August	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	4	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16
September	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16	4 5/16
October	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16
November	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16
December	3 15/16	3 15/16	3 15/16	—	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16	3 15/16
1933																																
January	—	—	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	—	—	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	—	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	2 15/16	3 1/16	3 1/16
February	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16
March	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16
April	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
May	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16
June	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16
July	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16
August	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16
September	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16
October	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16	7 5/16
November	7 7/16	7 7/16	8	8 1/16	9 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16	8 1/16
December	9 1/16	9 1/16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1934																																
January	—	9	8 1/16	9	10 3/16	9	10 3/16	—	8 3/4	8 3/4	8 5/16	8 5/16	8 5/16	—	9 1/16	9	—	8 3/4	8 3/4	9 3/16	—	9 1/2	9 5/16	9 3/16	9 11/16	10 1/16	10	—	10 3/16	10	9 3/16	9 3/16
February	9 1/16	9 1/16	9 1/16	—	—	—	10 3/16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Spot Closing Prices— Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1929

Year	Cents	Year	Cents	Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15	1922	17.50	1926	48.50
1911	141.30	1915	65.85	1919	48.70	1923	29.45	1927	37.72
1912	121.60	1916	72.50	1920	36.30	1924	26.20	1928	22.48
1913	82.04	1917	72.23	1921	16.36	1925	72.46	1929	20.55

Average Monthly Price per Pound Since 1927

Month	1928 Cents	1929 Cents	1930 Cents	1931 Cents	1932 Cents	1933 Cents	1934 Cents
Jan.	40.25	20.14	15.24	8.34	4.38	3.08	9.32
Feb.	32.75	23.97	15.85	7.70	4.03	2.95	....
Mar.	26.82	24.55	15.34	7.71	3.35	3.01	....
Apr.	18.97	21.18	14.93	6.43	3.02	3.56	....
May	18.99	21.46	14.24	6.49	3.09	4.95	....
June	19.59	20.64	12.45	6.35	2.66	6.15	....
July	19.40	21.30	11.24	6.37	2.89	8.01	....
Aug.	19.46	20.59	9.96	5.38	3.63	7.31	....
Sept.	18.47	20.37	8.28	5.08	3.84	7.30	....
Oct.	18.83	19.67	8.20	4.87	3.65	7.64	....
Nov.	18.26	16.62	9.01	4.65	3.44	8.66	....
Dec.	17.97	16.12	9.05	4.64	3.24	8.87	....
Average for Year	22.48	20.55	11.98	6.17	3.49	5.96	....

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	Nov.	Dec.	Jan.	Feb.	Day	Nov.	Dec.	Jan.	Feb.
1	3 7/16	4 11/32	—	4 11/32	17	4 1/16	—	4 7/16	
2	3 11/32	4 11/32	4 3/32	4 11/32	18	4 1/16	4 3/32	4 1/2	
3	3 11/32	—	4 1/4	4 3/4	19	—	4 3/32	4 1/2	
4	4	4 11/32	4 3/32	—	20	4 3/32	4 1/2	4 17/32	
5	—	4 1/4	4 1/4	4 3/32	21	4 1/16	4 7/16	—	
6	3 31/32	4 7/16	9 3/32	4 11/32	22	4 3/32	4 7/16	4 11/32	
7	3 31/32	4 3/32	—	4 11/32	23	4 3/32	—	4 1/2	
8	3 31/32	4 3/32	4 3/32		24	4 1/16	—	4 11/32	
9	4 3/32	4 3/32	4 3/32		25	4 1/32	—	4 5/16	
10	4 1/16	—	4 1/4		26	—	—	4 3/16	
11	—	4 3/32	4 1/2		27	4 3/32	4 1/4	4 1/16	
12	—	4 3/32	4 3/32		28	4 3/32	4 3/32	—	
13	4 1/32	4 3/32	4 3/32		29	4 3/32	4 1/32	4 3/32	
14	4 3/32	4 3/16	—		30	4 1/16	—	4 1/16	
15	4 3/32	4 3/16	4 3/16		31	—	—	4 3/32	
16	4 1/16	4 3/32	4 1/4						

Average Monthly Price Per Pound

Month	1931 Pence	1932 Pence	1933 Pence	1934 Pence	Month	1931 Pence	1932 Pence	1933 Pence	1934 Pence
Jan.	4.160	3.052	2.264	4.429	Aug ...	3.385	2.654	3.811	
Feb. ...	3.823	2.760	2.093		Sept. ..	2.524	2.485	3.728	
Mar. ...	3.822	2.047	2.099		Oct. ...	2.898	2.425	3.957	
Apr. ...	3.082	1.876	2.323		Nov. ..	2.890	2.518	4.096	
May ...	3.035	1.825	2.966		Dec. ..	3.115	2.444	4.200	
June ..	3.082	1.750	3.392		Average for				
July ...	3.048	1.875	3.860		Year ...	3.155	2.434	3.233	

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Date	Dec.	Jan.	Feb.	Date	Dec.	Jan.	Feb.	Date	Dec.	Jan.	Feb.
1	10.20	——	11.75	11	10.20	11.10		21	10.00	——	
2	10.15	10.50	11.80	12	10.15	11.05		22	10.25	11.50	
3	——	10.45	11.95	13	10.20	11.25		23	——	11.50	
4	10.05	10.65	——	14	10.15	——		24	——	11.45	
5	10.20	10.55	11.95	15	10.20	11.65		25	——	11.45	
6	10.15	10.75	12.15	16	10.10	11.60		26	10.15	11.35	
7	10.15	——	12.25	17	——	11.55		27	10.30	11.50	
8	10.10	10.85		18	10.05	11.50		28	10.35	——	
9	10.20	10.95		19	10.15	11.65		29	10.30	11.70	
10	——	11.05		20	10.05	11.60		30	——	11.70	
								31	——	11.75	

Average Monthly Price Per Pound

Month	1931 Cents	1932 Cents	1933 Cents	1934 Cents	Month	1931 Cents	1932 Cents	1933 Cents	1934 Cents
Jan.	10.27	6.65	6.23	11.25	Aug. ...	7.21	7.43	9.55	
Feb. ...	10.96	6.85	6.05		Sept. ...	6.52	6.30	9.64	
Mar. ...	10.90	6.86	6.39		Oct. ...	6.32	6.30	9.58	
Apr. ...	10.19	6.16	7.02		Nov. ...	6.44	6.22	10.04	
May ...	9.38	5.72	8.64		Dec. ...	6.25	6.00	10.17	
June ...	9.05	5.02	9.47		Average for				
July ...	9.28	5.87	10.76		Year ...	8.56	6.41	8.63	

* Exchanges closed due to Bank Moratorium.

World Stocks of Crude Rubber

ON HAND OR AFLOAT TO THE U. S.

At End of	ON HAND 1931	ON HAND 1932	ON HAND 1933	AFLOAT 1931	AFLOAT 1932	AFLOAT 1933	ON HAND AND AFLOAT 1931	ON HAND AND AFLOAT 1932	ON HAND AND AFLOAT 1933
Jan.	209,487	322,860	396,376	56,187	42,234	32,539	265,674	365,094	428,915
Feb.	212,833	318,936	381,794	63,680	51,728	32,898	276,513	370,604	414,692
Mar.	217,804	329,586	390,135	63,133	44,190	29,531	280,937	373,776	419,666
Apr.	228,382	336,957	382,167	56,700	40,387	30,745	285,082	377,344	412,912
May	220,799	336,719	364,623	73,564	50,453	43,342	294,363	387,172	407,965
June	225,536	334,657	333,954	69,421	43,079	63,608	294,957	377,736	397,562
July	234,822	333,729	326,609	66,873	37,894	57,435	301,695	371,623	384,044
Aug.	240,816	342,888	325,148	61,469	42,846	53,084	302,285	385,734	378,232
Sept.	254,324	346,154	334,637	62,420	46,188	57,255	316,744	342,342	391,892
Oct.	273,456	358,282	343,579	68,427	40,176	58,568	341,883	398,458	402,147
Nov.	292,493	360,386	353,852	77,443	40,879	57,140	369,936	401,265	410,992
Dec.	322,826	379,000	364,541	53,940	38,360	55,606	376,766	417,360	419,147

(Rubber Manufacturers' Association figures raised to 100%)

STOCKS IN GREAT BRITAIN

Stocks in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1931	1932	1933	At end of	1931	1932	1933
Jan.	81,093	67,166	36,481	July	81,317	48,842	41,178
Feb.	82,265	65,942	37,182	Aug.	81,560	47,079	39,480
Mar.	84,736	64,280	40,845	Sept.	79,692	44,942	39,237
Apr.	86,831	61,848	40,911	Oct.	76,778	42,327	37,101
May	86,683	56,089	41,998	Nov.	73,911	40,606	36,139
June	83,071	51,009	43,032	Dec.	69,470	37,407	....

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1933					
July	43,748	43,319	42,745	42,046	41,161
August	41,211	40,544	40,166	39,237	
September	39,472	39,257	39,191	39,292	39,221
October	38,935	38,565	38,457	37,898	
November	37,170	36,831	36,443	36,360	
December	36,165	35,853	35,970	35,643	35,777
1934					
January	36,478	37,326	38,333	38,537	

Stocks in Liverpool

1933					
July	59,560	59,372	59,135	59,901	58,864
August	58,540	58,391	58,050	57,508	
September	57,266	57,213	56,826	56,625	56,164
October	54,899	54,134	53,500	52,969	
November	52,818	52,910	52,466	52,418	
December	51,894	51,803	51,954	51,206	51,014
1934					
January	51,434	51,897	52,256	52,037	

STOCKS IN PENANG AND SINGAPORE

(Stocks held by Dealers—Quantities in Long Tons)

End of	1930	1931	1932	1933	End of	1930	1931	1932	1933
Jan.	39,727	48,802	48,850	22,525	July	45,459	51,203	17,017	36,972
Feb.	44,371	49,283	46,954	21,530	Aug.	48,132	48,971	20,649	38,601
Mar.	45,657	49,590	46,591	24,594	Sept.	44,015	47,025	20,415	36,948
Apr.	48,473	45,868	39,663	25,460	Oct.	39,930	52,132	23,158	37,282
May	44,715	44,278	38,690	29,822	Nov.	41,674	46,947	25,419	39,018
June	42,451	47,517	19,770	34,676	Dec.	45,963	45,795	25,341	38,269

STOCKS IN OTHER CENTRES

End of 1933:	Malaya Mainland	Afloat for Europe	Holland	Colombo	Para and Manaos
Jan.	38,844	25,080	2,143	4,662	5,676
Feb.	37,323	28,540	2,033	4,210	6,006
Mar.	33,494	26,180	2,183	3,779	5,780
Apr.	33,391	27,710	2,214	3,428	5,204
May	32,613	24,090	1,534	3,177	4,790
June	35,919	22,930	1,147	2,913	4,321
July	35,020	22,900	1,007	3,208	3,830
Aug.	36,756	22,900	1,033	3,411	3,588
Sept.	36,083	22,000	1,107	4,286	3,288
Oct.	37,302	25,900	1,411	4,889	3,237
Nov.	36,965	28,320	1,285		3,383
Dec.	38,441	28,000			2,981

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total		Total		Total
1924	21,863,311	1928	24,247,282	1932	6,261,336
1925	26,001,664	1929	24,141,502	1933	8,713,962
1926	24,199,524	1930	17,364,096	1934	.....
1927	19,700,003	1931	11,253,800	1935	.....
1934:		1934:		1934:	
January	789,274	May	.....	September	.....
February	.....	June	.....	October	.....
March	.....	July	.....	November	.....
April	.....	August	.....	December	.....

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1925	1926	1927	1928	1929	1930	1931	1932
Production	60,845	61,237	64,439	77,944	68,726	50,965	48,739	40,085
Shipments	59,262	59,002	64,059	74,296	69,395	53,638	48,151	40,260
Inventory [2]	8,142	10,456	10,264	13,624	11,838	9,003	7,775	7,644

Figures for Recent Months

	PRODUCTION 1931	PRODUCTION 1932	PRODUCTION 1933	SHIPMENTS 1931	SHIPMENTS 1932	SHIPMENTS 1933	INVENTORY 1931	INVENTORY 1932	INVENTORY 1933
Jan.	3,675	3,462	2,258	3,744	3,253	2,597	8,957	7,912	7,237
Feb.	3,985	3,871	2,339	3,402	2,553	2,292	9,536	9,172	7,377
Mar.	4,663	3,671	2,038	4,122	2,954	2,092	10,014	9,878	7,290
Apr.	4,944	3,517	3,123	4,932	3,698	3,654	10,031	9,846	6,778
May	5,679	3,820	5,189	5,415	4,258	5,180	10,312	9,379	6,760
June	5,672	5,643	6,100	5,572	10,065	6,305	10,447	4,999	6,615
July	4,926	3,617	5,714	5,462	2,404	5,497	9,919	6,203	6,844
Aug.	3,906	3,089	4,994	4,960	2,655	4,707	8,896	6,659	7,070
Sept.	3,172	2,539	3,999	3,932	3,082	3,503	8,158	6,096	7,595
Oct.	2,974	2,569	3,429	2,852	1,799	2,537	8,300	6,876	8,462
Nov.	2,500	2,304	3,039	2,887	1,711	2,197	7,919	7,454	9,247
Dec.	2,643	1,983	....	2,781	1,819	....	7,775	7,644	....

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1925	1926	1927	1928	1929	1930	1931	1932
Production	82,614	76,618	70,823	80,180	68,829	52,420	48,333	36,801
Shipments	81,004	71,591	72,896	77,127	70,592	54,938	50,021	37,935
Inventory [2]	11,313	16,200	13,692	16,117	12,807	9,999	7,922	6,749

Figures for Recent Months

	PRODUCTION 1931	PRODUCTION 1932	PRODUCTION 1933	SHIPMENTS 1931	SHIPMENTS 1932	SHIPMENTS 1933	INVENTORY 1931	INVENTORY 1932	INVENTORY 1933
Jan.	3,623	3,308	2,093	4,062	3,529	2,535	9,439	7,719	6,197
Feb.	3,916	3,281	2,224	3,400	2,728	2,102	9,921	8,760	6,357
Mar.	4,450	3,502	1,883	3,789	2,686	1,902	10,475	9,448	6,369
Apr.	4,617	3,225	2,853	4,636	3,385	3,051	10,413	9,441	6,189
May	5,413	3,409	4,700	5,281	3,867	4,463	10,459	8,913	6,382
June	5,358	5,279	5,448	5,397	9,019	5,778	10,504	5,174	6,097
July	4,955	2,937	5,603	5,831	2,160	5,211	9,589	5,975	6,440
Aug.	4,435	2,748	4,916	5,301	2,503	4,687	8,774	6,127	6,628
Sept.	3,449	2,601	3,827	4,150	3,098	3,472	8,095	5,753	7,008
Oct.	3,077	2,187	3,506	2,813	1,658	2,676	8,321	6,214	7,831
Nov.	2,443	2,005	2,863	2,594	1,578	2,103	8,119	6,662	8,625
Dec.	2,597	1,779	....	2,767	1,724	....	7,922	6,749	....

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% complete up until 1929 and 80% complete beginning with 1929, and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States Total	United States Passenger Cars	United States Trucks	Canada Total	Canada Passenger Cars	Canada Trucks	Grand Total
1926	4,298,799	3,808,753	490,046	205,002	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	453,019	179,426	146,850	32,556	3,573,313
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929	5,358,420	4,587,400	771,020	263,295	207,498	55,797	5,621,715
1930	3,355,986	2,814,452	540,534	154,192	125,442	28,750	3,510,178
1931	2,389,730	1,973,090	416,640	82,621	63,477	19,144	2,472,351
1932	1,370,678	1,135,493	235,187	60,816	50,718	10,098	1,431,494
1933							
Jan.	130,044	108,326	21,718	3,358	2,921	437	133,402
Feb.	106,825	91,492	15,333	3,298	3,025	273	110,123
Mar.	117,949	99,885	18,064	6,632	5,927	705	124,581
Apr.	180,667	153,350	27,317	8,255	6,957	1,298	189,922
May	218,303	184,698	33,605	9,396	8,024	1,372	227,669
June	253,322	211,483	41,839	7,323	6,005	1,318	260,645
July	233,088	195,023	38,065	6,540	5,322	1,218	239,628
Aug.	236,487	195,144	41,343	6,079	4,919	1,160	242,566
Sept.	196,082	160,900	35,182	5,808	4,358	1,450	201,990
Oct.	138,485	108,073	30,412	3,682	2,723	959	142,167
Nov.	63,904	44,429	19,475	2,291	1,503	786	66,195
Dec.	84,045	53,900	30,145	3,262	2,171	1,091	87,317
Total	1,959,201	1,606,703	352,498	65,924	58,855	12,069	2,025,125

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA [1]							DUTCH EAST INDIES [3]							
	Gross Exports	Gross Exports Minus Imports	Ceylon [2]	India & Burma [3]	Sarawak [4]	British North Borneo [3]	Siam [4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China [3]	Amazon Valley	All Other [6]	World Total [7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,415
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	514,487
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1930	547,043	133,876	413,167	76,970	10,782	10,309	6,781	4,251	69,755	79,396	115,254	7,665	14,260	5,651	814,241
1931	519,740	125,506	394,234	61,769	8,470	10,451	6,247	4,218	75,952	87,747	116,009	11,696	12,121	3,292	792,203
1932	478,252	92,539	385,713	48,973	3,888	6,960	4,664	3,451	61,312	79,837	85,871	13,883	6,450	1,816	702,818
1932:															
July	40,723	5,346	35,377	3,501	99	442	400	184	5,779	6,257	6,145	1,233	232	141	59,790
Aug.	39,327	7,371	31,956	4,717	129	506	400	300	4,803	4,882	7,244	1,088	303	49	56,377
Sept.	41,973	8,869	33,104	5,238	122	614	400	340	3,858	6,485	7,664	1,621	318	78	59,733
Oct.	37,931	9,798	28,133	2,945	139	583	350	428	4,022	7,051	8,944	1,147	414	247	54,403
Nov.	40,098	10,072	30,026	4,146	185	683	350	371	4,368	6,250	9,080	805	1,164	156	57,588
Dec.	40,118	10,089	30,029	5,801	367	644	350	406	4,683	7,066	8,594	1,211	824	150*	59,493
1933:															
Jan.	46,599	7,857	38,742	4,602	318	590	458	305	4,766	5,630	6,840	1,957	554	125*	58,887
Feb.	37,564	6,167	31,397	5,064	304	541	458	368	4,895	5,119	6,081	895	620	125*	55,867
Mar.	42,059	7,964	34,095	4,905	389	571	458	304	5,092	6,466	6,999	1,102	995	125*	61,501
Apr.	36,752	7,758	28,994	4,582	272	624	583	235	5,226	5,969	8,147	1,122	556	125*	56,435
May	42,902	13,664	29,238	4,643	475	1,091	583	359	6,782	7,298	13,195	1,371	918	125*	66,078
June	41,411	16,538	24,873	5,198	377	1,149	582	632	7,352	6,654	14,779	1,369	704	125*	63,794
July	50,531	18,772	31,759	4,201	270	1,358	728	797	7,367	8,580	16,534	1,310	913	125*	73,942
Aug.	52,266	17,869	34,397	5,839	246	955	728	926	6,460	7,985	15,161	808	1,116	125*	74,746
Sept.	49,607	15,146	34,461	5,111	125	1,027	728	611	5,868	9,164	15,005	1,702	656	125*	74,452
Oct.	61,002	17,390	43,612	5,674	271	959	750	979	6,329	8,692	15,170	1,513	965	125*	84,879
Nov.	54,599	20,142	34,457	6,097	516	1,020	750	1,191	6,684	9,951	14,474	1,599	956	125*	
Dec.	57,579	18,110	39,469	7,062		989	750*	1,046	7,030	10,183	17,274	2,175	930	125*	
1934:															
Jan.	55,276	21,184	34,092	7,551											

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927, 1,437 in 1928, 2,670 in 1929, and 1,274 in 1930. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons in 1924, 6 tons in 1925, 20 tons in 1926, about ½ ton in 1927, and 1 ton in 1928, and practically none in 1929, 1930 and 1931. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons in 1924, 2,239 tons in 1925, 44 tons in 1926, 84 tons in 1927, 1,459 tons in 1928, 1,302 tons in 1929, and 2,656 tons in 1930. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands, and includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. * Figure is provisional; final figure will be shown when available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States [1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	238,407	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	343,808
1920	249,530	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	371,409
1921	179,736	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,620
1922	296,594	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	—3,807	1,778	589	567	396,222
1923	301,527	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	409,173
1924	319,103	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	—807	3,178	944	1,370	416,203
1925	385,596	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	520,274
1926	399,981	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	617,957
1927	403,472	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	632,768
1928	407,572	4,846	36,498	37,855	30,447	25,621	12,433	15,134	8,430	7,958	2,243	4,418	3,178	3,138	599,771
1929	528,608	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	894,638
1930	458,036	120,069	68,503	45,488	28,793	33,039	18,639	16,387	5,354	10,635	2,924	7,710	2,400	4,468	822,445
1931	475,993	86,170	46,466	39,688	25,261	43,483	10,149	30,671	7,649	11,009	2,220	6,360	2,605	7,717	794,641
1932	393,844	44,086	42,506	45,121	20,917	56,027	14,469	30,637	12,576	9,519	2,851	7,262	4,359	9,444	693,618
1932:															
June	39,136	1,853	3,666	3,405	2,834	2,834	1,534	5,291	1,421	449	127	578	196	280	63,604
July	30,494	4,082	3,125	3,380	1,529	2,544	1,116	1,735	624	725	—214	784	258	1,207	51,387
Aug.	32,650	6,671	4,919	4,006	970	3,390	1,615	1,740	751	1,211	—66	611	210	557	59,235
Sept.	26,865	3,942	5,845	3,674	2,770	5,878	971	1,376	625	694	103	534	267	406	54,220
Oct.	34,748	2,927	4,715	4,177	1,207	5,653	510	1,853	569	627	553	537	489	986	59,551
Nov.	27,689	4,950	3,830	3,577	1,593	4,563	1,265	1,481	1,653	1,035	275	489	631	650	53,681
Dec.	31,246	1,182	3,205	4,623	941	5,603	2,103	3,720	745	1,298	348	544	485	2,602	57,645
1933:															
Jan.	29,260	3,277	5,858	4,241	1,189	7,611	3,005	1,558	1,275	1,388	308	640	252	838	60,700
Feb.	22,970	7,102	6,603	4,460	1,175	8,508	994	2,820	2,001	1,670	375	564	132	681	60,055
Mar.	27,348	8,883	6,093	4,425	1,114	6,035	1,604	2,088	1,904	952	282	649	340	688	62,405
Apr.	20,236	7,765	6,308	4,805	555	5,495	2,215	2,274	1,580	882	163	606	281	400	53,565
May	24,894	11,085	4,144	4,622	1,704	5,289	1,278	1,691	425	710	—525	536	433	432	56,718
June	22,228	8,739	4,056	3,639	1,441	3,330	1,997	2,000	613	469	—519	772	541	400	49,706
July	43,824	3,961	3,774	4,103	1,192	1,460	1,146	2,952	2,347	299	16	486	435	287	66,282
Aug.	43,208	4,330	5,254	4,193	1,795	4,426	1,249	3,312	1,500	325	209	616	606	2,759	73,779
Sept.	43,886	4,341	4,111	5,84.	2,620	5,369	2,055	2,168	794	864	189	604	790	577	74,211
Oct.	43,366	3,373	4,921	4,772	2,580	6,150	1,836	2,085	604	1,118	310	777	44.	686	73,081
Nov.	39,633	3,955	5,419	4,086	2,184	6,296	942		301	1,129	222	878		882	
Dec.	38,864	6,524			1,773										

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1] United States imports of guayule are included in this compilation. * Figure is provisional; final figure will be shown immediately it becomes available.

There may be short-cut methods of evaluating carbon black, but we believe the CONSISTENT PRODUCTION of a DEPENDABLE PRODUCT for the rubber industry can only be maintained by CONSTANT RIGID CONTROL by means of ACTUAL RUBBER TEST. • As in the past, we shall continue to serve our customers by this EXTRA PROTECTION against any variation in carbon black.

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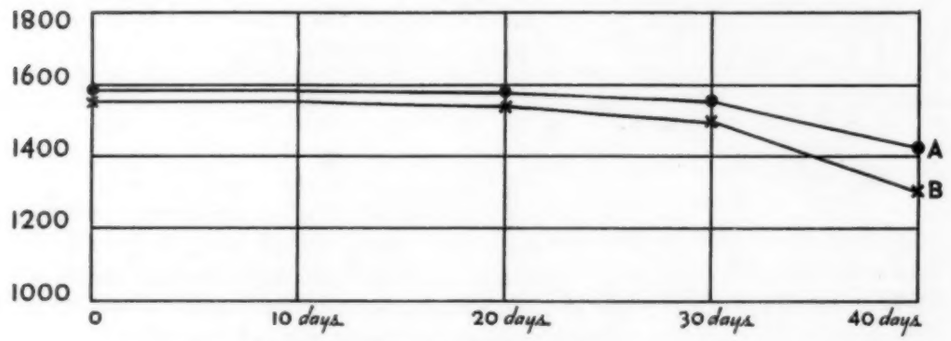
Rubber	100.	BLE	2.
Whiting	100.	Monex	2.6
Zinc Oxide	100.	Sulphur	0.4
Paraffin	3.		

A. 60-minute cure at 30 lbs. steam.

B. Average of 5 cures—30 minutes to 90 minutes at 30 lbs. steam.



Time in Oxygen Bomb at 70°C. 300 lbs. Oxygen.

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"LATEX AND ITS INDUSTRIAL APPLICATIONS"

By

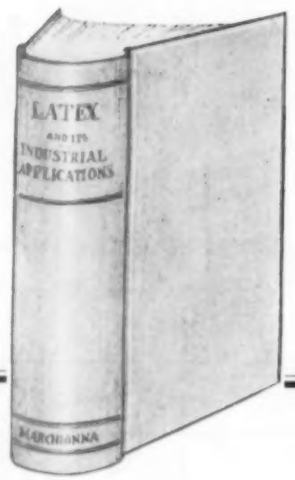
FREDERICK MARCHIONNA, M.S. Chem.
Member A. C. S.; National Geographic Society

With an Introduction by

Dr. G. BRUNI, of Pirelli Co., Milan, Italy

and

A Chapter on *Anti-Oxidants* by Sebrell, DeFrance and Clifford of the Research Laboratories of Goodyear Tire & Rubber Co.



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THIS book is the result of over eight years of research work by the author in collecting and preparing abstracts of over 600 technical papers and 1850 domestic and foreign patents on latex. Mr. Marchionna is well qualified by education and training to prepare a work of this kind for he is a graduate chemist, formerly with one of the larger Akron rubber companies and has been connected for a number of years with the U. S. Patent Office, Washington, D. C.

●

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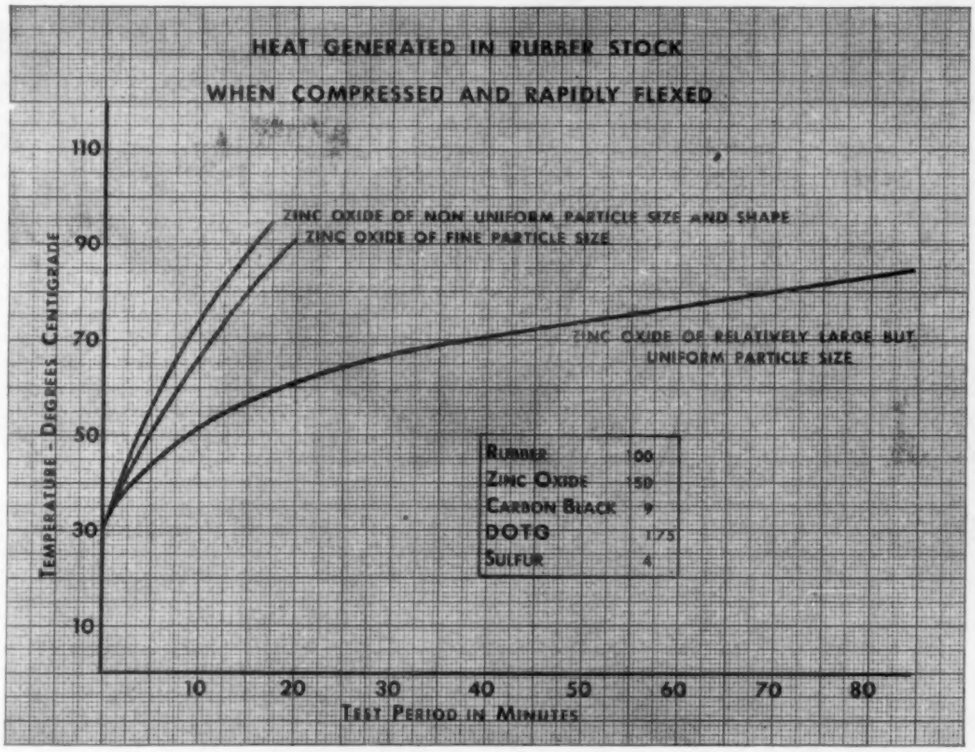

Test procedure consists of measuring the temperature increase at the center of sections of vulcanized rubber under compression and rapid flexing action. Test pieces are approximately 1 inch wide, 2 inches long, and 1½ inches deep. A load of 500 pounds is applied to the test piece which is then oscillated in a circular path of .55 inch diameter at 1,200 revolutions per minute.

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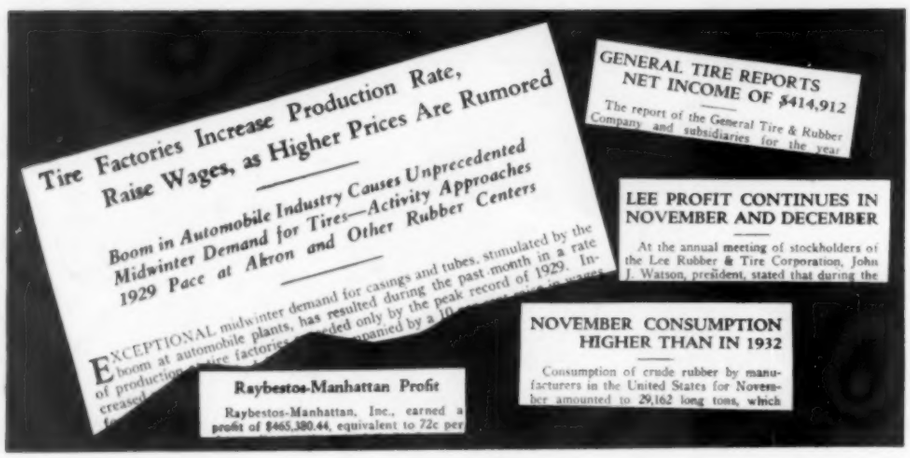
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Boom in Automobile Industry Causes Unprecedented Midwinter Demand for Tires—Activity Approaches 1929 Pace at Akron and Other Rubber Centers
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At the annual meeting of stockholders of the Lee Rubber & Tire Corporation, John J. Watson, president, stated that during the
NOVEMBER CONSUMPTION HIGHER THAN IN 1932
Consumption of crude rubber by manufacturers in the United States for November amounted to 29,162 long tons, which
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●

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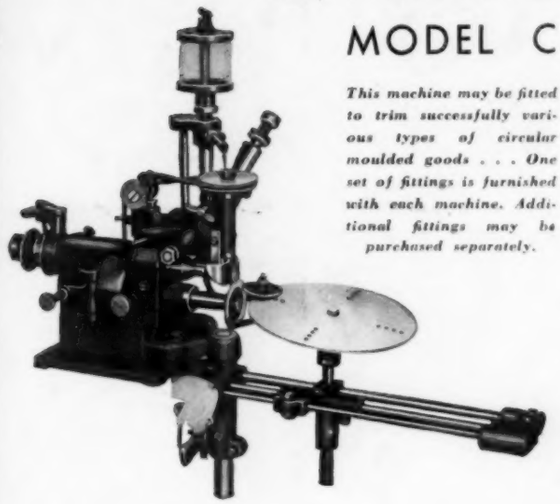

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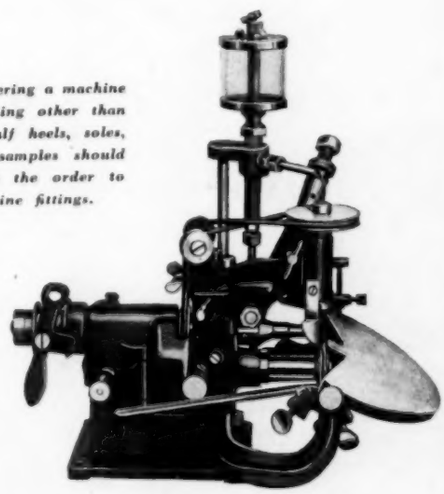

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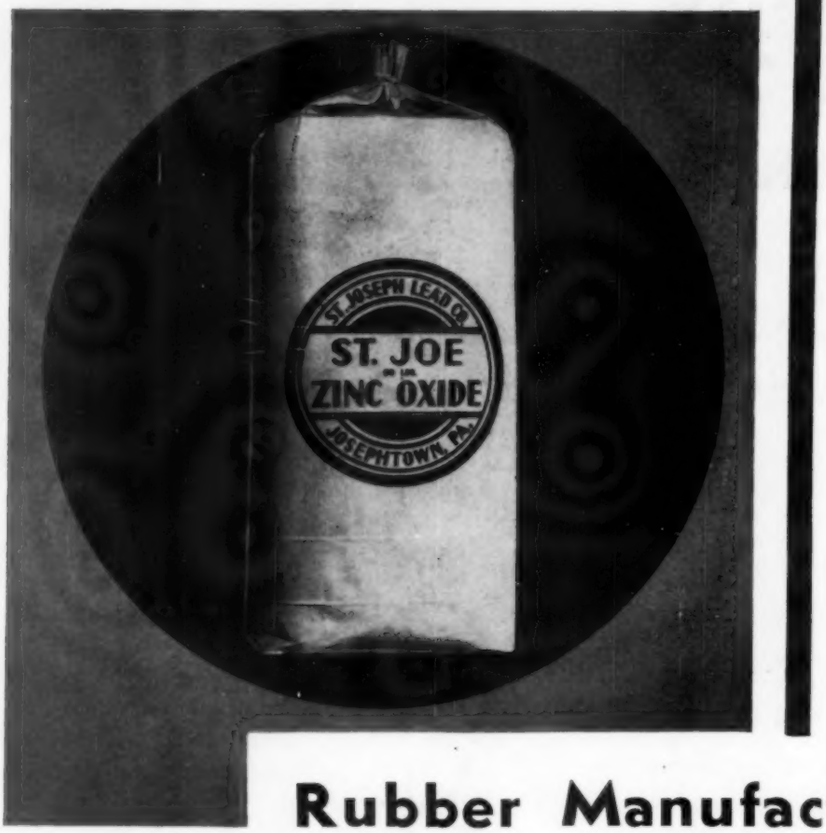

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